A CHILTON PUBLICATION

The Iron Age

THE NATIONAL METALWORKING WEEKLY

December 25, 1952

CONTENTS PAGE 2

Farval helps McKay handle tough plate leveling jobs

FLATTENING heavy steel plates is always a tough job. The rollers that do the leveling and the bearings on which they run are built to take plenty of punishment.

To keep all bearings on its levelers functioning smoothly and efficiently, McKay employs Farval Centralized Lubrication. In fact, Farval has been standard equipment for many years on all the roller levelers and many other types of machines this company manufactures.

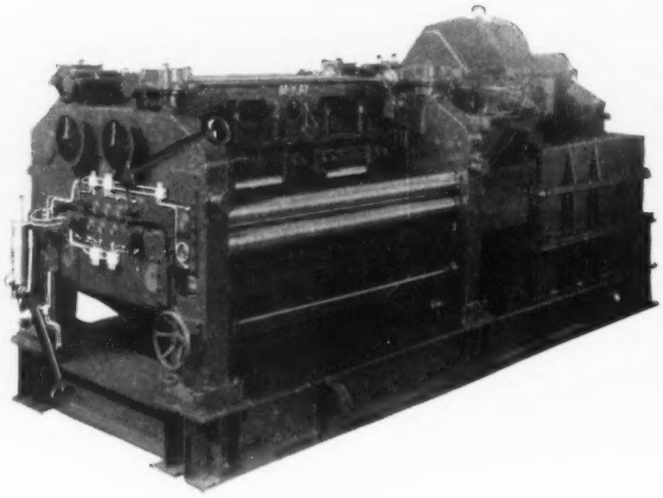
Farval assures that every bearing regularly gets the exact, measured amount of lubricant it requires. Special oilers are not needed, lubricant consumption is reduced, bearing life is extended indefinitely and shutdowns for oiling or bearing replacement are eliminated. In short, with Farval on the job, the purchaser of a McKay leveler is insured of getting all the value built into the machine by its manufacturer.

Farval is the original Dualine system of centralized lubrication for industrial equipment, proved practical in 25 years of service. The Farval valve has only two moving parts—is simple, sure and foolproof, without springs, ball-checks or pinhole ports to cause trouble. Through its full hydraulic operation, the Farval system unfailingly delivers oil or grease to each bearing—as much as you want, exactly measured—as often as desired. Indicators at all bearings show that each valve has functioned.

In or near your city there's a Farval engineer, ready to discuss your lubrication problems and suggest a proper system to meet your particular needs. The Farval Corporation, 3252 East 80th Street, Cleveland 4, Ohio.

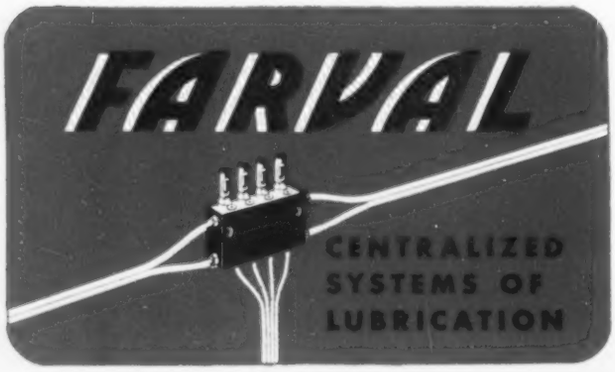
Affiliate of The Cleveland Worm and Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.

FARVAL—*Studies in Centralized Lubrication*
No. 129



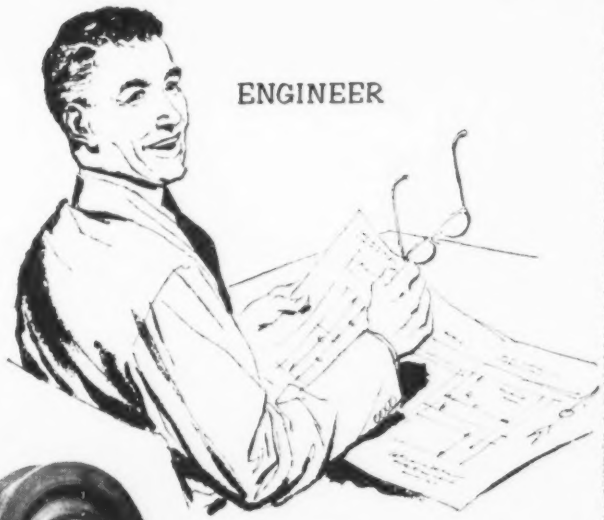
KEYS TO ADEQUATE LUBRICATION—*Whenever you see the sign of Farval—the familiar valve manifolds, dual lubricant lines and central pumping station—you know a machine is being properly lubricated. Farval manually operated and automatic systems protect millions of industrial bearings.*

Photo above by courtesy of The McKay Machine Company.



The Blanks They Recommend—and Why

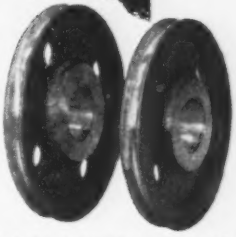
ENGINEER



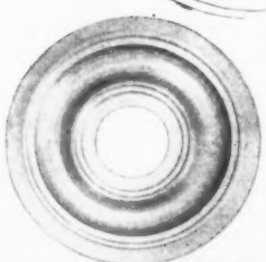
"In designing our machines, we have to consider both strength and weight. When we need circular steel blanks, we ask Purchasing to get them from Bethlehem. Bethlehem blanks are so strong that we can sometimes use thinner sections. This reduces weight."

METALLURGIST

"Bethlehem has an unusual method of forging and rolling the blanks in a single operation. Tests we've run show homogeneity and very good grain structure. Also, the blanks can be furnished untreated or heat-treated, as we prefer."



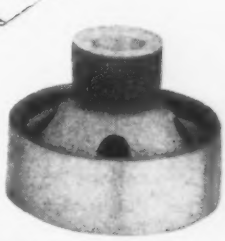
MACHINIST



"I get along with 'em fine. They don't give me any trouble. They're free of the flaws that sometimes make you discard a piece and begin all over. Nice easy cutting all the way."

PURCHASING AGENT

"We have to watch costs, and Bethlehem blanks are competitive price-wise. Deliveries dependable, too. And we like the wide range of sizes —10 to 42 in. OD. As a company buyer, I've got Bethlehem circular blanks on my preferred list."



Bethlehem suggests that you, too, request these sturdy steel products when making gears, crane or sheave wheels, flywheels, turbine rotors, tire molds, brake drums, industrial wheels, or anything else of similar nature. Ask for full details—or write for a free copy of illustrated Booklet 216.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM ROLLED-and-FORGED CIRCULAR PRODUCTS

The Iron Age

Vol. 170, No. 26, December 25, 1952

* Starred items are digested at the right.

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DIGEST of

NEWS DEVELOPMENTS

LOSS OF INDUSTRY IS CHOKING A SMALL TOWN—P. 17
As local coal mines fade out, Mount Carmel, Pa., is rapidly becoming a ghost town. With no place to work, the young people are moving out. But areas like this could solve the problems of industries in cities which are short of both space and labor. Effort is needed to bring in industry. One attempt failed.

TOOL AND DIE MEN PREDICT 2 GOOD YEARS—P. 20
Consensus of tool and die industry leaders is that business will stay good for 2 years—maybe longer. Expanding civilian production lines are seen as taking up slack from military stretchouts. Other problems, such as manpower and wage and price controls, are causing more concern than sales.

NEED HEAVIER ACCENT ON INDUSTRY HEALTH—P. 21
New processes and materials can be the source of undreamed of medical hazards. Industrial hygiene specialists give startling examples of compensation cases, law suits and bad publicity resulting from previously unknown dangers of newer materials. Better information, education needed.

GALVANIZERS ARE HAPPY ABOUT '53 OUTLOOK—P. 27
The zinc shortage, a plague to galvanizers a year ago, is no more. But last summer's strike has kept steel supplies short. Sales right now are spotty but galvanizers optimistically tag this a year-end lull. While continuous lines produce only 5 pct of galvanized steel, the trend is in that direction.

ACCENT SWITCHING TO DUAL PURPOSE PLANTS—P. 39
New Administration will push peace-or-war plants in government-guided expansions. Production of guns or butter or both is the keynote of future Secretary of Defense C. E. Wilson's plan. Republican-promised tax cuts will come slowly, in an orderly way. Keeping some taxes would need Congressional action.

WELCOME MAT IS OUT FOR SUPER-SIZE TOOLS—P. 45
Defense Production Administration is waiting with open arms for applications to build new facilities to make giant tools. About 450 huge, multi-purpose precision tools are needed to support the heavy press program and others. But tool builders aren't rushing in, fearing the job's war-baby nature.

the Week in Metalworking

ENGINEERING & PRODUCTION

GOOD SETUPS SPEED STEERING GEAR OUTPUT—P. 65
Output of cam and lever steering gears has been facilitated by a variety of unique fixtures and setups. Rough and finish hobbing tools are used on a 100-ton hydraulic press to "plug" tapered serrations in a tapered hole. Wide integral keys on piston rods are produced by hobbing with a formed cutter.

STAINLESS STEEL PARTS REDUCE UPKEEP COST—P. 68
Maintenance and down-time costs can be reduced substantially by replacing nuts, bolts and other parts of carbon steel with stainless steel parts, particularly where such parts are subject to the effects of corrosion, abrasion or heat. Removal by force can be avoided by using stainless steel parts.

FLOATING DIE TABLE EQUALIZES PRESS ACTION—P. 78
Action of a floating die table and a descending upper punch is applied to punch presses designed to produce the same forces obtained with a dual-punch press. The pressure created forms parts of uniform density from powdered metal particles. This feature eliminates the need of an expensive dual-punch press.

INDUCTIVE STIRRER USED IN ELECTRIC FURNACE—P. 82
Following the lead of Swedish quality steel producers, Timken has applied the use of inductive stirring to large electric furnaces. Experiences confirm all claims made for the device. Better quality steels of more consistent chemistry are made faster. Control of carbon and grain size is more accurate.

NEXT WEEK—SPECIAL ANNUAL ISSUE

Next week The Iron Age 98th annual issue presents an outstanding fact-jammed review and forecast for the metalworking industries. A 96-page statistical section presents valuable data on production and use of metals. The tool steel directory and heat-treating guide has been completely revised for convenient use in your plant.

A 32-page appraisal of business conditions and production processes in 1952, plus fresh reports on trends and developments to watch in 1953 has been prepared by Iron Age editors. A listing of 200 trade associations has been up-dated. Major meetings and conventions for 1953 are listed. Regular news-market coverage is included.

MARKETS & PRICES

WHAT WILL INDEX REVISION DO TO WAGES?—P. 19
Labor Dept. has its fingers crossed on the effect of the new BLS Consumer Price Index on wages. There's no standard wage contract conversion formula. This could result in a wave of labor demands for renegotiation of contracts. January will change base to which thousands of contracts are tied.

FURNACE MAKERS SEE SLIGHT SALES DECLINE—P. 23
Manufacturers of industrial furnaces are girding for another good year in 1953. But it can't reach the volume of 1952. Backlogs are dipping and deliveries are shortening. Despite strong competition coming in some lines, there should be pie for all at least until the middle of the year.

CAN MILL SCRAP STOCKS PREVENT SHORTAGE?—P. 24
Last winter saw steelmakers scraping for every pound of scrap to keep furnaces going. Will history repeat? This year it seems to be "No!" Hefty mill stockpiles are ample protection. Washington recently sounded a warning which was immediately wondered at by the scrap trade despite slim dealer stocks.

FORD CHALLENGES CHEVROLET FOR '53 TITLE—P. 34
Ford and Chevrolet will soon come out fighting for the sales and production championship of the automotive industry. Most of the ringside money is on Chevrolet though Ford will consolidate its 1952 gains. Prelim with NPA gave Ford the publicity edge but Chevvy has a strong punch in new styling.

STEEL MARKET SIGNALS PRODUCTION RECORDS—P. 89
Sustained pressure from steel buyers in the face of record production by the mills forecasts new all-time production records in industries other than steel. One explanation is that election jitters caused some buyers to hold their enthusiasm in check. Seeing nothing to fear, they are turning it loose.

ODM RECOMMENDS NEW ALUMINUM PRICE HIKE—P. 92
Price relief for the aluminum industry may come sooner than expected. Defense mobilizers have proposed a ½¢ boost on pig and ingot, 4 pct on finished and fabricated forms. Would total almost what industry asked last summer. Plan change in government aluminum procurement contracts.

Only B. F. Goodrich makes the grommet belts that cut costs 20 to 50%!

Save 3 ways! Investigate today! Write or mail coupon

You save belt costs because belts last longer, save production costs because machines keep running with fewer interruptions, save maintenance costs because they need less attention.

Patented grommet belts by B. F. Goodrich represent the only basic change since invention of the V belt. Belts last 20 to 50 per cent longer, depending on service. (The more severe the service, the greater the increase over ordinary belts.) Grommet belts have more rubber; they're more flexible, give better grip, less slip.

What is a grommet?

A grommet is like a giant cable except that it's *endless*—a cord loop built up by winding heavy cord on itself. There is no overlapping cord *section* as in all ordinary belts. Most belt failures occur in these sections where cords overlap!

All cords put to work

Each of the two grommets and every part of a grommet carry their share of the load. In ordinary belts under high tension the center cords "dish" because tension is greater near the driving faces. Dished cords are doing less work, not pulling their share. Grommet belts have no center cords, there is no dishing—therefore much more strength in proportion to cord volume—and less stretch. Grommet belts stretch, on an average, only about one-third as much as ordinary belts.

Better grip, less slip

Grommet belts have more rubber in relation to belt size. Without any stiff overlap, they're more flexible, grip pulleys better. Size for size, grommet belts give ⅓ more gripping power, pull heavier loads with a higher safety factor. Because there is less slip, there is also less surface wear.

Send for proof

Send the coupon for a set of reports telling users' experiences and showing actual installations where grommet belts outlasted all others. Some typical cases:

". . . within a few days ordinary belts had stretched . . . After six months of 24-hour-a-day service BFG grommet belts haven't stretched at all . . ."

"Ordinary belts lasted only 5 or 6 weeks . . . B. F. Goodrich grommet belts are in their sixth month of service . . ."

"Previous belts suffered from shock loads, wore out fast . . . BFG grommet belts have been in service 2 years with no shut-downs..."

There are hundreds of cases like these.

They cost no more

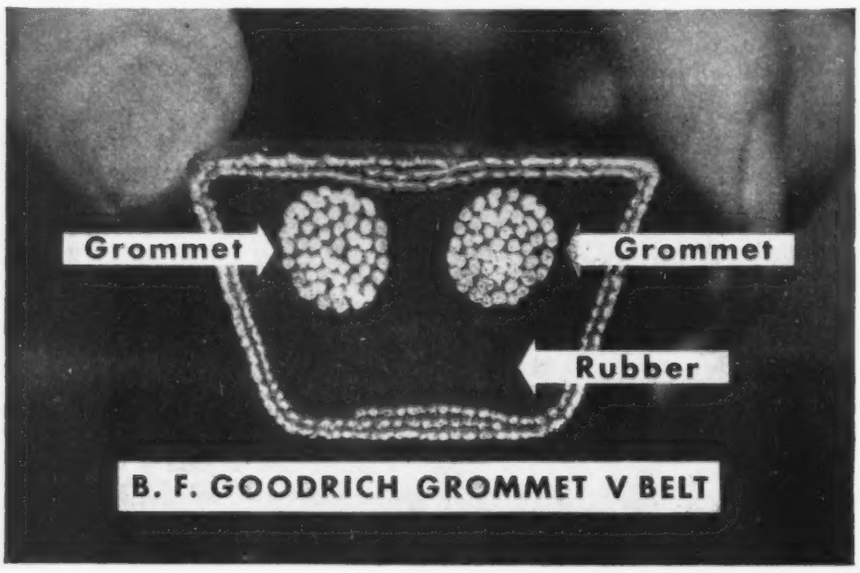
BFG grommet belts cost not one cent more than others. The savings they make for you are clear profit. They are made in C, D and E sections. They are patented by B. F. Goodrich. No other V belt is a grommet belt (U. S. Patent No. 2,233,294).

Write, send the coupon or see your B. F. Goodrich distributor. (He will show you his "X-ray" belt that shows the grommet construction clearly.)

Grommet V-Belts BY

B.F.Goodrich

FIRST IN RUBBER



The B. F. Goodrich Company
Dept. IA-12
Akron, Ohio

☐ Send set of reports telling users' experiences and showing actual installations proving that B. F. Goodrich grommet belts outlast all others.

☐ Have distributor show me the "X-ray" belt that shows how B. F. Goodrich grommet belts are made.

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Firm Name_____

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Street Address_____

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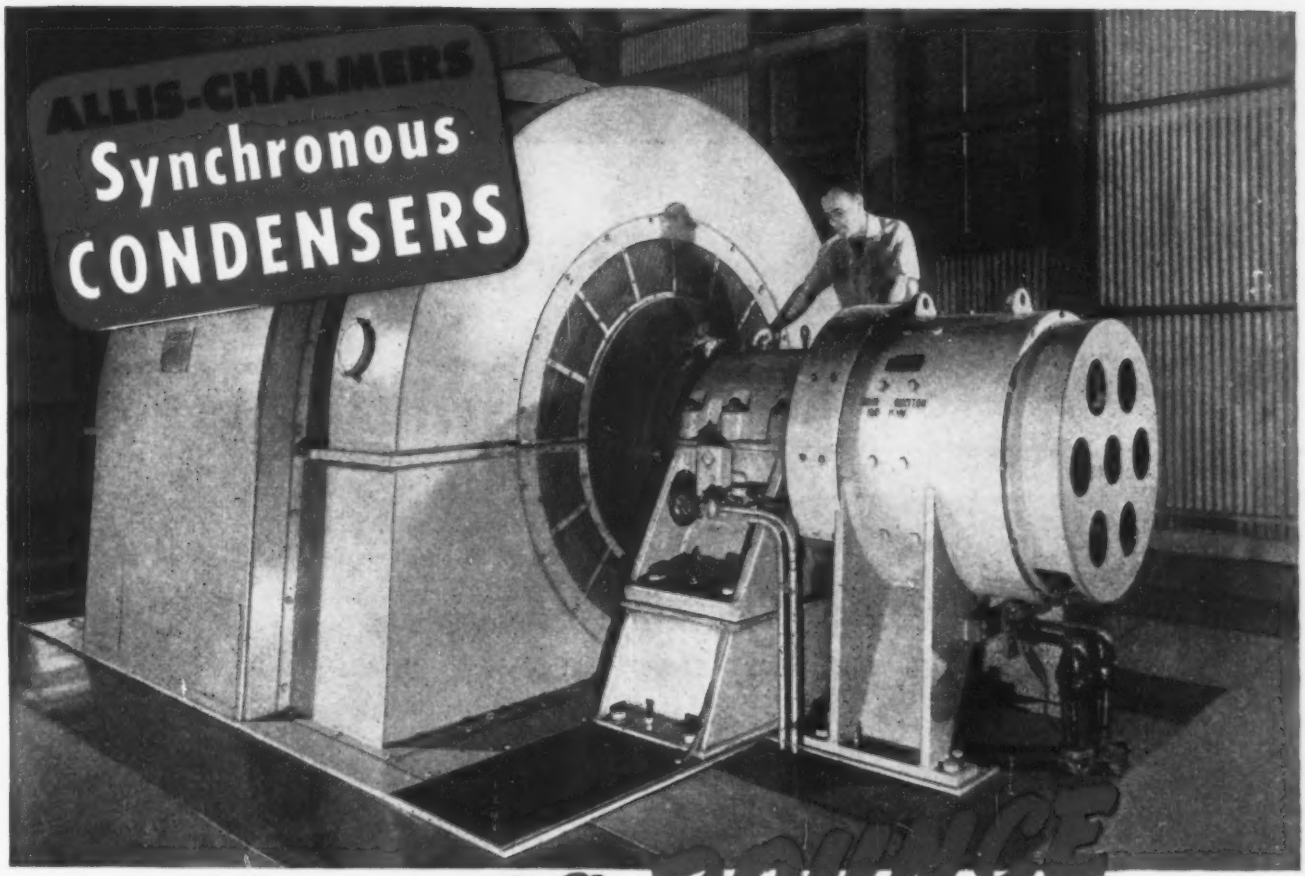
State_____



FOR LESS BOUNCE TO THE ARC

this low reactance condenser insulates power system from violent arc furnace load swings

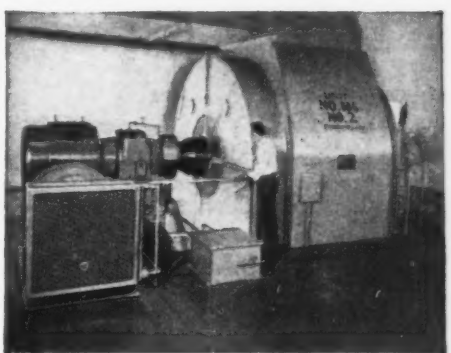
RECENTLY INSTALLED in a southern steel plant, this 25,000-kva synchronous condenser was designed to solve a serious power supply problem. In adding a large arc furnace, the plant engineers had to keep the voltage disturbances from bouncing back into the local power system.

Short of producing their own power, they had a choice of three ways of doing this. They chose a synchronous condenser because it could do the job more economically and more reliably than a motor-generator set and could handle the violent kva fluctuations better than series capacitors.

With the condenser and furnace in parallel, a buffer reactor on the line insures adequate absorption of the arcing transients by the condenser. And pilot excitation from a *Regulex* control provides high speed response to the reactive kva swings of the furnace.

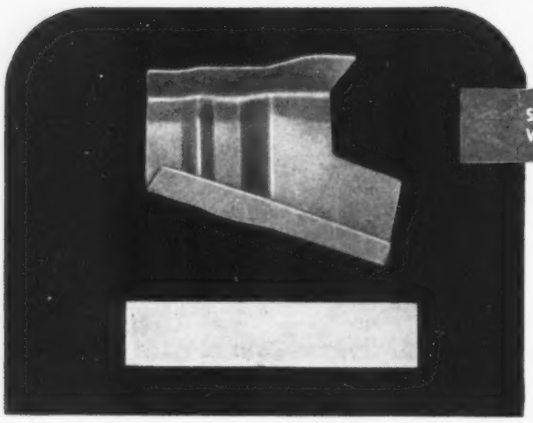
If you need a special condenser or one for power factor correction, Allis-Chalmers can supply a unit engineered to your requirements. For construction features, ratings and standards, ask your A-C representative for Bulletin 05B7285. Or write to Allis-Chalmers, Milwaukee 1, Wisconsin. A-3853

Regulex is an Allis-Chalmers trademark.



One of two units installed for power factor correction in a large Ohio steel plant, this 20,000-kva synchronous condenser paid for itself within a short period of time.

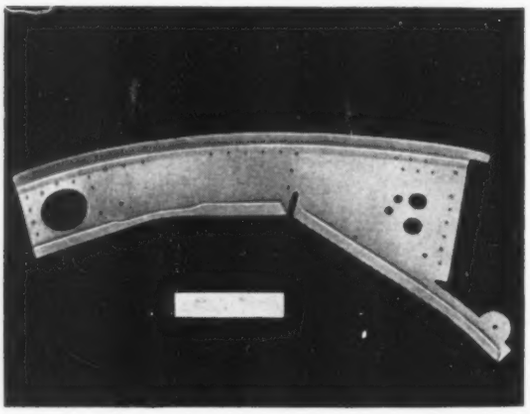
ALLIS-CHALMERS

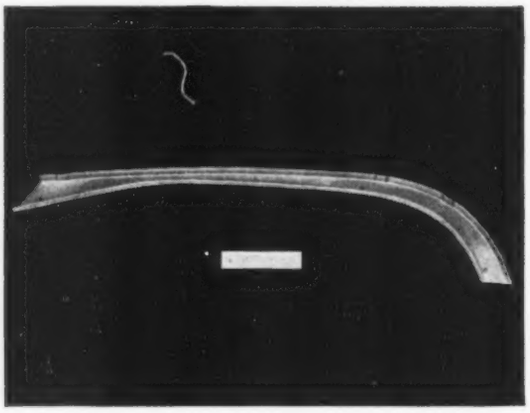


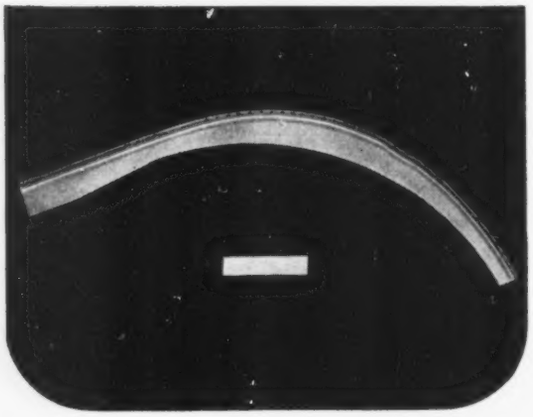
Stainless structural parts for airplanes. White rule represents 6 inches.

50% GREATER DESIGN STRENGTH

With Armco 17-7 PH







Vital formed structurals in certain airplane fuselages formerly were made of Type 301 half-hard temper stainless steel. Here is what the manufacturer gained by changing over to Armco 17-7 PH Stainless Steel:

50-94% INCREASE IN YIELD STRENGTH

Instead of a yield strength in tension of 110,000 psi minimum, he had his choice of yield strengths as high as 165,000 psi minimum in finished parts.

Yield strength in compression could be increased correspondingly from 85,000 psi to as high as 165,000 psi minimum.

23% INCREASE IN TENSILE STRENGTH

Ultimate tensile strength of the finished structural parts could be increased from 150,000 psi minimum to as high as 185,000 psi.

IMPROVED WORKABILITY

Fabrication difficulties were also overcome. Half-hard temper Type 301 must be worked in the hard condition. With an elongation of only 15-18 per cent in 2", it is difficult to form and results are often inconsistent.

On the other hand, Armco 17-7 PH may be worked in the fully annealed condition and hardened by heat treatment *after fabrication*. With an elongation of 20-40 per cent in 2", it will take far more severe forming than Type 301, half-hard. Its high strength is developed through a double low-temperature heat treatment of 1400 F plus 950-1050 F. Scale developed in heat treatment comes off readily in sandblasting.

This is but a thumb-nail sketch of the advantages of Armco 17-7 PH in structural applications. Write for complete information on this precipitation-hardening chromium-nickel stainless steel.

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1183 Curtis Street, Middletown, Ohio
Plants and sales offices from coast to coast
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ARMCO

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Food For Thought

THESE are times of great stress. The tempo in business is at a terrific rate. It looks as if it may stay that way for the rest of our natural lives. Each week that goes by means that someone gives up the ghost. He may be young, middle-aged or elderly.

This tendency to take on more than one can handle has resulted in obituaries that run as low as 38 years old. Then they seem to jump to 42 thence to 48. There is a quiet period before a 52 and 54 rash breaks out.

Businessmen have been watching this trend. They may not admit it but the obituary columns of the newspapers get a good going over each morning. What is on that page often determines what mood the reader will be in that day.

It is food for thought to discover the ages of the men passing out of the picture today. They seem to run in cycles. One week they are young. The next week they are too young to give up. Then come many weeks where those whose names occupy the page are grand fellows who have lived to a ripe age of 80, 90 or more.

If the fellow looking at the page is 50 years old and the phase that week is 45 years then he actually breathes a sigh of relief. If the age of those letting go is around 50 he is in for a tough day. Those around him know it.

When the youngsters take a look at the sheet and see where those lovable experts have lived to 80 or 90 it is a sunny day. It may mean a raise in pay for someone, a good dinner, no clouts on the head for the kids and a general feeling of well being.

This searching of the obituary page is usually done by those between the ages of 45 and 65. Those who are older have found out that there are many things which have no answer. To them plans are only plans. They can meet their Maker with an understanding smile.

How about those who can't help but get a real shock each time they see 38, 45, 50, 61 and 66 obituaries? The best piece of advice was given recently by Ralph J. Cordiner, president, General Electric Co., "The decreasing age at which managers carrying heavy responsibilities are dying . . . is the result of too much hurry and worry by top executives . . . take it easy and you will last longer . . ."

Tom Campbell

Editor

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Buy through Distributors!

The *way you buy* can slice costs and insure greater convenience . . . that's why it pays to *Buy through Distributors!*

It saves transportation costs . . . cuts down on costly paper work by centralizing your buying in fewer sources . . . holds down costly inventories . . . offers immediate price and catalog information . . . insures faster service on adjustments and complaints . . . gives you superior credit facilities.

Save time and money with Black & Decker Tools . . . sold through leading distributors everywhere! These world-famous tools give you dependable, full-powered motors . . . perfect balance and streamlined design . . . tough, longer-wearing parts for years of top-notch service!

LEADING DISTRIBUTORS EVERYWHERE SELL

B&D **Black & Decker**

PORTABLE ELECTRIC **TOOLS**

WORLD'S LARGEST, MOST COMPLETE LINE

THE BLACK & DECKER MFG. CO.,
Dept. 603, Towson 4, Md.

Dear Editor:

Letters from readers

Customer Is Back

Sir:

We would appreciate receiving 25 or so tear sheets of the editorial "The Customer Is Back" which appeared in your Nov. 6 issue.

A. H. HEIDEMAN
Purchasing Agent
Peterboro Look Mfg. Co., Ltd.
Peterboro, Ont.

Continuous Casting

Sir:

I have just read your fine article "Continuous Casting of Semifinished Steel." The article was reprinted from THE IRON AGE, Aug. 19, 1948.

I would appreciate any information about the manufacturers of the nonferrous and ferrous continuous casting machines mentioned in the article. Reference is made to the Rossi-Junghaus, Aluminum Co. of America and Poland Eldred machines. A machine that was designed by the International Nickel Co. is also referred to.

We would like to know how these machines are applied to casting operations.

E. HARNESS
Metallurgist
H. M. Harper Co.
Morton Grove, Ill.

An up-to-date article on the continuous casting practice on four major metals appeared in a series entitled "Continuous Casting Aluminum, Brass, Copper, Steel" in the Aug. 30, 1951, Sept. 6, 1951, Sept. 13, 1951, and Sept. 20, 1951 issues.—Ed.

Lighter Pumps

Sir:

We would appreciate having permission to reprint an article that appeared in your Aug. 28 issue. The article is "Fabricated Castings and Plate Make Lighter Pumps."

C. G. HERBRUCK
Asst. to Secretary
Lincoln Electric Co.
Cleveland

Aeroplast Dressing

Sir:

We have read with interest the item on the Newsfront page of the Nov. 27 issue regarding a new quick treatment for burns and cuts, described as an aeroplast dressing.

We would appreciate information as to where we might obtain full particulars regarding this type of dressing.

T. M. FLETCHER
Marlin-Rockwell Corp.
Jamestown, N. Y.

For more information write to Protective Treatments, Inc., Dayton.—Ed.

Taper Grinding

Sir:

We liked the article by Queyrel on "How to Taper Aluminum Plate by Abrasive Belt Grinding."

We would appreciate three or four tear sheets.

E. S. KOPECKI
Asst. to Public Relations Mgr.
The Carborundum Co.
Niagara Falls, N. Y.

Hardness Rating Curve

Sir:

We have been endeavoring for some time to find the source of a hardness rating curve which we have recently seen. As we recall it, the chart consisted of a curve based on the diametral pitch of the gear, the depth from the surface of the gear tooth, and the minimum core hardness.

We have been advised that an article on this curve was published in THE IRON AGE. We would greatly appreciate a reprint or the date of publication.

G. M. PAMPHILON
Engineer
Johnson Gear & Mfg. Co., Ltd.
Berkeley, Calif.

Information on the hardness rating curve for hypoid pinions appeared in the article "Boron Steels, A New Era In Alloy Metallurgy", Part III, July 19, 1951, p. 103.—Ed.

Small Shops

Sir:

Please send us five reprints of the article "How A Small Shop Uses Quality Control" appearing in the June 19 issue.

P. NEWQUIST
David Bradley Mfg. Works
Bradley, Ill.

Jet Engine Material

Sir:

We would appreciate receiving four tear sheets of the article entitled "Hot-Cold Work Improves 16-25-6 Properties" which appeared in the Nov. 20 issue.

P. H. DALEY
General Manager
Heppenstall Co.
Eddystone, Pa.

Spring Pointers

Sir:

We would appreciate 24 copies of the article "Automatic Bar Pointer Improves Spring Production" by W. G. Patton, appearing in the Nov. 27 issue.

E. E. HARRISON
Sales Manager
Coulter & McKenzie Machine Co.
Bridgeport, Conn.

Fatigue Cracks

by William M. Coffey

Merry Christmas

We have an Irish setter chez moi (that's french for house me) and the only trouble with him is that he thinks he's people. Very sensitive people, too. Feelings are easily hurt and when that happens a more pathetic (that's english) looking neurotic you've never seen. All the usual things happen. Big gobs of tears come to his eyes, the ears droop to the floor and his tail goes between his you-know-whats. In this state he is a very sorry sight—and today that's the way we feel. Sad to relate the powers are keeping us on Fatigue Cracks in spite of our gentle hint last week to Editor Tom Campbell that we'd do better writing the editorials. Deeply we sympathize with you. Merry Christmas.

and Happy New Year

Yes, the battle is lost. We're sorry to say you still have to put up with things like this:

An habitual punster was condemned to death because his listeners had grown so fed up with his puns. As he languished in the death cell a group of tenderhearted citizens prevailed upon the mayor to pardon the punster. The mayor consented. The kindhearted citizens brought the punster the news. Delighted he cried, "Ah! No noose is good noose." And so they hung him.

Eat, drink and be merry, for tomorrow you diet.

Eureka!

Chemists who recently convened at Little Rock, Arkansas were startled to hear from Mr. H. N. Dunning and Mr. J. W. Moore of the Bureau of Mines and Dr. Milton O. Denekas of the University of Tulsa that the mining of metals from oil wells may someday be economically worthwhile. Certain types of crude oils found in California definitely contain appreciable amounts of nickel and vanadium compounds, these scientists reported. *O. K., Florida, your turn.*

Reader Service Department

Mrs. Helena Bixler of Pittsburgh, Pa., writes: "Can you tell me why my husband puts on his socks before he dons his undershirt?" Answer: "Dear Mrs. H. B.: We do not understand modern painting."

Puzzles

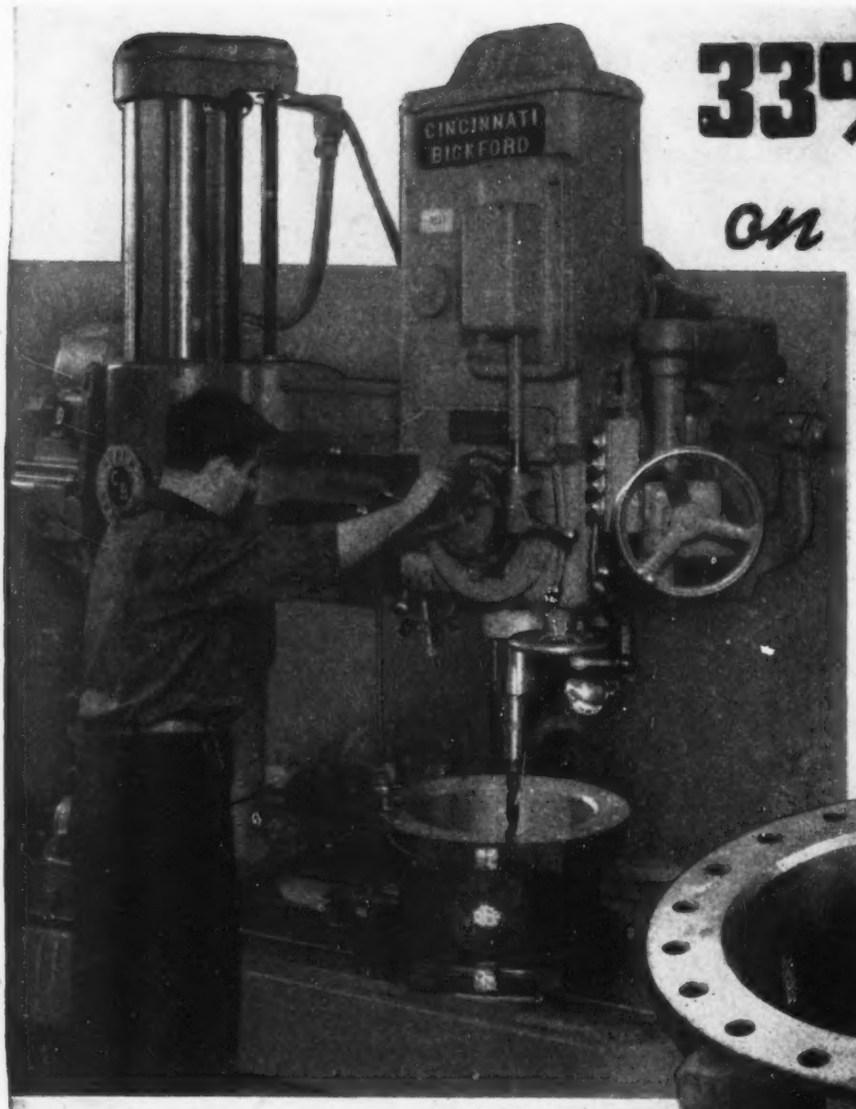
Here are winners to the dancing children puzzle: Bruce Belyea, Detroit, Mich.; L. D. (In again) Rice, Canton, Ohio; John (In again) McMurray, Indianapolis, Ind.; D. S. Tarr, Baltimore, Md.; Robert Lofy, Milwaukee, Wisc.; and Art Tebbe, Delphos, Ohio. The correct answer is six rings.

At the top of the list of winners of the license plate puzzle we're putting Miss Evelyn Murphy of the Albert & J. M. Anderson Mfg. Co., Boston. Not only did Miss Murphy get the correct answer but she also writes a very nice letter. This puzzle, incidentally, had four possible answers to it so, as another winner, Mr. Borden of Ebasco Services, New York City said, it would be smart to keep the boy off the witness stand.

Other winners so far: W. B. Melin, Rodgers Hydraulics, St. Louis Park, Minn.; E. A. (In again) Schwab, Emerson Corp., New York City; B. E. Yarotsky, Illinois Institute of Technology; F. J. Binckes, Binckes Engr. Co., Kalamazoo, Mich.; W. Clay (In again) Babcock, Kimble Glass Company, Toledo, Ohio; Herbert Epstein, National Machinery Exchange, New York City; W. F. Braasch, The Lakeshore Machine Co., Sheboygan, Wisc.; and W. B. Lobbenberg, American Nickel Alloy Mfg. Corp., New York City; D. S. (In again) Tarr, Tarrcraft, Baltimore, Md.; W. E. McCord, Baltimore, Md.; George Burley, Motor Products Corp., Detroit, Mich.; H. W. Leidy, R.C.A Victor, Camden, N. J.; D. J. Rahn, Firth Sterling, Inc., McKeesport, Pa.; and Capt. W. T. Hines, USN, Naval Test Station, Trenton, N. J. The answers are 21, 42, 68 and 84.

New Puzzle

A man with no other money took a check to a bank to turn into cash. In error, the paying teller gave the man the number of dollars specified on the check as cents, and the number of cents specified on the check as dollars. Subsequently, the man spent twice the amount of the original check, and then had left one-half as many cents as the number of dollars specified on the check. What was the amount of the check? (from Charles Pipenbagen, Jr., Chicago.)

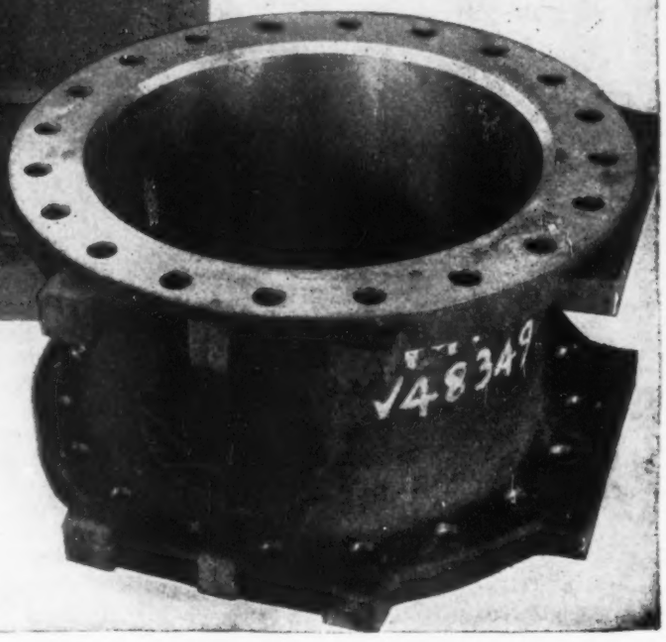


33⅓% SAVED *on Cast Steel*

Satisfactory experience with other Cincinnati Bickford Super Service metal drilling machinery induced The R-S Products Company of Philadelphia, Pa., to install this 4' arm 13" diameter Column Super Service Radial.

They say, "Ease of handling has reduced operator fatigue and consequently has increased his productive capacity."

On these cast steel Butterfly Control Valve Bodies the floor to floor time on the previous machine was three hours, this same job, is now being done in two hours—a 33-1/3% savings.



4' arm 13" diameter Column Cincinnati Bickford Super Service Radial, drilling forty 1-1/4" diameter flange holes through 1-3/4" - 20" diameter Cast Steel Valve Body.

Many features contribute to the outstanding performance of Cincinnati Bickford Super Service Radial Drills.

The great range of speeds and feeds (36 speeds, 18 feeds) and step-saving controls centralized in the Super Service clear view head step up production.

Bickford hydraulic column clamps are standard, and the heavy arm, column, column trunk and base give great strength and rigidity.

Long life, low maintenance and accurate performance are all recognized features of Cincinnati Bickford Super Service Radial Drills.

Write for Bulletin R-29.

CINCINNATI BICKFORD

RADIAL AND UPRIGHT DRILLING MACHINES

THE CINCINNATI BICKFORD TOOL CO.

Cincinnati 9, Ohio, U.S.A.

Conventions & Meetings

1953

Jan. 11-13—Institute of Scrap Iron & Steel, Inc., annual convention, Hotel Commodore, New York. Institute headquarters are at 1729 H Street, Northwest, Washington.

Jan. 12-13—Industrial Furnace Manufacturers Assn., Inc., midwinter meeting, Cleveland Hotel, Cleveland. Association headquarters are at 412 Fifth St., N.W., Washington.

Jan. 12-16—Society of Automotive Engineers, annual meeting and engineering display, Sheraton-Cadillac Hotel, Detroit. Society headquarters are at 29 W 39th St., New York.

Jan. 13—Mining & Metallurgical Society of America, annual meeting, Mining Club, New York. Society headquarters are at 11 Broadway, New York.

Jan. 14-16—Compressed Air & Gas Institute, annual meeting, Dayton Biltmore Hotel, Dayton. Institute headquarters are at 122 E. 42nd St., New York.

Jan. 15-17—National Tool & Die Manufacturers Assn., winter meeting, Sorrento Hotel, Miami Beach, Fla. Association headquarters are at 907 Public Square Bldg., Cleveland.

Jan. 19-21—Hydraulic Institute, annual meeting, The Homestead, Hot Springs, Va. Institute headquarters are at 122 E 42nd St., New York.

Jan. 21—American Boiler Manufacturers Assn. & Affiliated Industries, mid-winter meeting, Hotel Cleveland, Cleveland. Association headquarters are at 1571 W. 117th St., Cleveland.

Jan. 21-22—Steel Shipping Container Institute, winter meeting, Hampshire House and Hotel Pierre, New York. Institute headquarters are at 500 Fifth Ave., New York.

Jan. 21-23—Society of Plastics Engineers, Inc., annual meeting, Statler Hotel, Boston. Society headquarters are at 513 Security Bank Bldg., Athens, Ohio.

Jan. 22-23—Steel Plate Fabricators Assn., annual meeting, Palmer House, Chicago. Association headquarters are at 37 West Van Buren St., Chicago.

Jan. 26-27—Compressed Gas Association, Inc., The Waldorf-Astoria, New York. Association headquarters are at 11 W. 42nd St., New York.

Jan. 26-28—Truck Trailer Manufacturers Assn., annual convention, Edgewater Gulf Hotel, Edgewater Gulf, Miss. Association headquarters are at 1024 National Press Bldg., Washington.

Feb. 9-10—Multiple V-Belt Drive and Mechanical Power Transmission Assn., Hotel Statler, St. Louis, Mo. Association headquarters are at 27 East Monroe St., Chicago.

Feb. 16-19—American Institute of Mining & Metallurgical Engineers annual meeting, Statler Hotel, Los Angeles. Institute headquarters are at 29 W. 39th St., New York.

Mar. 2-6—American Society for Testing Materials, spring meeting, Statler Hotel, Detroit. Society headquarters are at 1916 Race St., Philadelphia.

Mar. 9-11—Manufacturing Standardization Society of the Valve & Fittings Industry, annual meeting, Commodore Hotel, New York. Society headquarters are at 420 Lexington Ave., New York.

the Iron Age
FOUNDED 1855

THE IRON AGE Newsfront

A SERIOUS PROBLEM in heavy press program is tremendous size of die blocks required. Sizes involved may necessitate use of segmented die blocks which would be locked in press. Otherwise production would be limited to comparatively few producers.

TITANIUM METALLURGY IS MOVING FORWARD under impact of wide research. Recent investigations have shown that both cerium and barium restrict grain growth of commercially pure titanium.

IT SCARCELY SOUNDS POSSIBLE, BUT some 1953 models are already being discounted in Detroit. Whether this is a barometer of sales resistance coming up next year or just seasonal apathy is not yet clear.

STOCKPILING FOR DISASTER. Portable electric power equipment and mobile water chlorinator units are just two items being stockpiled by Federal Civil Defense Administration. They'll supply power to light emergency hospitals, and water for mass feeding areas after enemy attack. All items for this stockpile: $84 million.

ORDNANCE CONTRACTORS MAY SOON GET drawings and specs for a 100-ft drop tester now operating at the Naval Ordnance Laboratory, White Oak, Md. It's relatively inexpensive, can be moved to the job, and can simulate a free fall up to 100 ft at accelerations of 50 to 250 G.

AUTOMATIC CUTTING of noncircular brass gears used in ordnance instruments is being done by one firm on a specially adapted gear shaper. Master gears used in copying attachments are not needed. Data is fed into the machine from a motion picture film. Small quantities of gears needed make automatic operation desirable from a cost and delivery viewpoint.

SHIPPERS REPRESENTING THE ALLEGHENY REGION are forecasting a decline in carloading for the first quarter of 1953. They estimate a first quarter total of 960,148--down 24,257 from first quarter '52. Coal and coke may be hardest hit with drop of 6.2 pct.

MORE GAGES WILL BE BUILT IN machine tools of the future. It's a trend. Present practice in supplying equipment for gaging tolerances of machine parts is to hang the gage on the machine.

MARKETS IN INDIA, CEYLON AND THAILAND could be opened wide with help of commercial air transportation, one industrialist claims. Exchange of raw materials from the Far East with manufactured products from United States would help both East and West.

THE AUTO INDUSTRY IS BETTING that industry production quotas will, in effect, be non-existent after the first quarter. This is miles away from current NPA sentiments on the subject.

A MAJOR PROBLEM IN AUTOMATION is how and where to obtain enough skilled help. Maintenance of high production equipment is a must if the equipment is to pay its way. Even at today's level of mechanization qualified help is scarce in industrial areas such as Detroit.

INFRARED DEFROSTERS for use in aircraft will soon be tested by the United States Air Force. They are designed to prevent moisture formation on the inside of Plexiglas canopies.

INDUSTRY: A Town Is Dying Without It

Fadeout of coal mining is rapidly making Mount Carmel, Pa., a ghost town . . . New industry must be brought in . . . Labor supply is plentiful . . . What can be done?—*By E. C. Kellogg.*

Around Christmas time, Mount Carmel, Pa., looks like any prosperous small town in the U. S. Oak St. is cheerfully decorated with the usual assortment of lights and wreaths and the shops are amply stocked. But the Christmas trappings only momentarily hide the bleakness of a town that is slowly dying.

As is true of most of the small communities in Pennsylvania's anthracite region, coal has supported Mount Carmel for more than 100 years. But since the end of World War II, this foundation has started to give way.

Mechanized Mining—With coal demand dropping and costs going higher as the mines go deeper, some of the coal companies have left the area. In fields that are being worked, companies are switching from deep mining to more highly mechanized strip operations, which means fewer jobs.

Result is unemployment and an exodus of young people to the cities. The state's unemployment field office told THE IRON AGE there are around 3200 out of work in the Greater Mount Carmel area, of which 2400 are men. Another 700 may be added to the list of the jobless next year, if rumored mine closures become a reality.

The unemployment figure is not much higher than is usual for the area, but this is because so many young people have moved out of town and found jobs in the cities. In less than 10 years, the population of Mount Carmel has dipped from nearly 18,000 to 14,000. This downward trend is continuing.

Work In Cities — Many of the men who do stay in town drive as much as 85 miles a day to jobs in the city. Others share apartments in industrial centers and just return to Mount Carmel on the weekends.

Few of the younger men are interested in going into the mines even when jobs are available. The high hourly pay rate is no incentive, since most of the miners in the area work only about 3 days a week. Yearly pay averages around $2400.

Solution to the problem in Mount Carmel and other towns like it is, of course, to bring in new industry. Except for a cigar factory and some textiles mills in which women hold most of the jobs, Mount Carmel is strictly a "coal cracker" town.

Labor Supply—But Mount Carmel does have one of the most important resources needed to attract new industry—an abundant manpower supply. One conservative estimate is that between 3000 and 5000 workers would be immediately available to industries establishing plants in the area. Though most of the men are not highly skilled, a surprising number have had vocational training in high school or in G.I. programs.

Because of this labor supply, areas like Mount Carmel could solve the problem of plants that are trying to expand in labor-short, space-cramped cities.

In addition to manpower the area also has better than average transportation facilities. The Lehigh, Pennsylvania and Reading railroads all operate around Mount Carmel and a Federal and State highway criss-cross in the town.

DECEIVING: Conventional appearance of Mount Carmel's Main street at Christmas time hides the fact that the town is slowly dying because coal mining is on the wane.

Central Location—Another factor favoring Mount Carmel as well as any other town in Pennsylvania is its central location. Pennsylvania Dept. of Commerce estimates that within a 500 mile radius of the state there are 51 pct of the nation's population and 53 pct of its markets.

On the debit side is the scarcity of existing facilities in which a manufacturer could install equipment. Unlike the New England area where closed textile mills still stand, all the anthracite region has

MACHINE WORKS: Mount Carmel's one attempt to bring in new industry was ill-fated. The plant site has since been converted into a garage.

to show for the slump of its industry are holes in the ground.

Despite its defects, which include hilly terrain, inadequate housing, and below average recreational facilities, the assets of the area seem to outweigh its defects as a location for small industry or branch plant operations.

Community Action — One obstacle to this needed sales program is community lethargy. Everyone in Mount Carmel is aware of what's happening to the town, but few are interested enough to take any action. The younger people, though they would prefer to stay in their hometown, find moving out the easiest solution. Many older residents are content to let the government take care of them, or at least look in this direction for leadership in bringing industry into the area.

There are exceptions, of course. Last year, a group of young people, who were seriously concerned with the future of the town, formed the Greater Mount Carmel Industries, Assn., Inc., to bring in industry. The association succeeded in raising $25,000 in contributions which were used to expedite the establishment of a machine works in Mount Carmel.

Unfortunately, the firm went into bankrupcy after 6 months. Exact reasons for the plant's failure are difficult to determine. But the firm had been successful in getting new orders and had an order backlog when it went out of business, association people say.

Lines Form—An indication of the abundant labor supply around Mount Carmel is the fact that 2 hr after the machine shop announced it would take applications for employment, 200 men had signed up. Of this number 68 were experienced machinists.

Failure of this one venture has quashed enthusiasm for new attempts to bring industry into the town. But Anthony Miscavige, Jr., former president of the now defunct Greater Mount Carmel Industries Assn., Inc., is working on new plans for the coming year. With the experience the town has gained from its previous attempt, the problem may be easier to solve.

Outside Help — Pennsylvania's Dept. of Commerce has been instrumental in helping many towns facing the same problem encountered by Mount Carmel. The most important aid it gives is showing towns how to set up a program designed to attract new industry.

The department believes any town trying to bring in new business should begin by making an accurate survey of its labor supply. This does not mean just counting noses of the number of workers. The survey should contain an exact analysis of the various skills of the available labor.

PLANT SITE: Drop in population caused one school to close. Its location near rail tracks makes it a possible plant site for a new business.

Other resources, such as water and power supply and plant sites, should be surveyed. High school students have been particularly helpful in conducting these studies in some towns.

Next step is to draw up a brochure outlining the community's advantages as an industrial location. Weak spots should not be hidden since they will be discovered by any businessman before he decides to start operations in a town.

STRIP MINING: Many of the coal companies in Pennsylvania's anthracite region have switched from deep mining to more mechanized strip operations. Result is fewer jobs.

WAGES: What Will Index Revision Do?

Labor Dept. keeps fingers crossed on effect of change in BLS Consumer Price Index . . . No standard wage contract conversion formula . . . Labor has kicks—By *A. K. Rannells.*

Will revision of Bureau of Labor Statistics' Consumer Price Index light a fuse, setting off a chain of demands by labor for renegotiation or reopening of contracts?

It could. The Labor Dept. is keeping its fingers crossed. It concedes that no matter how you look at it, the changeover in January is going to cause a lot of varied labor-industry headaches.

There has been a growing trend toward union contracts with escalator clauses tied to the BLS index. They provide automatic pay rises or cuts as the index moves upward or downward.

These contracts number into the thousands. The Labor Dept. estimates that more than 3.5 million workers are involved — including office and other white collar workers to whom industry has voluntarily extended coverage.

Coverage — Great majority of workers so covered are centralized within a few big industries. Metalworking (primarily automobile manufacture) and transportation each account for 42 pct of the workers known to be covered.

Within these industries, majority of coverage is represented in contracts with larger companies—General Motors, Chrysler, Ford, Briggs, International Harvester, United Air Lines, Greyhound Bus Lines, and General Electric, to name a few.

Not less than 80 unions, some of them big ones, have negotiated contracts with cost of living escalator clauses. United Auto Workers has made the most extensive use of this type of contract, representing one-third of such coverage.

Electrical workers and machinists are operating under such contracts. In addition, 15 railroad nonoperating unions and numerous others have adopted them.

Big trouble with the revised index: Even if labor were willing, there is no standard formula which could be used in converting existing escalator clauses to conform to the revised index.

A few contracts have provided for a conversion factor in making the changeover (revision of the index was announced a year ago). Some contracts expressly call for BLS to work out such a formula.

Won't Accept—But a majority carry no provision for making the shift. There is a growing suspicion in Washington that this group "will not accept an automatic changeover" even if a conversion factor is found.

Reports are sifting in to the effect that labor is not happy about the revised index. BLS says it is actually "more representative" of the true cost of living. Some labor disagrees.

Here's How

Revised Consumer Price Index is not the same as the interim index or the old index.

Two indices are now being published, the Interim Adjusted Index and Old Index. These end with the December index issued in January. January index will consist only of revised index, due out in February, and thereafter.

Revised index is based on average of 1947-49 as 100. For comparative purposes, an index standing at 190 on the old base would stand at about 115 under the new. Examples:

Date	Old Base	Revised
1935-39	100.0	59.8
1948 Avg.	171.9	102.8
Jan., 1951	181.5	108.6
1947-49	167.2	100.0

To make the index more realistic, BLS has added about 75 items which were not previously used on its pricing list. Total is now about 300 items.

For the first time, it now includes such things as used cars and baby foods which are recognized as part of living costs. It includes ice cream and candy.

Moreover, food previously made up about one-third of the old index. It now represents less than 30 pct. This is a sore point with the worker who sees 40 or 45 pct of his pay check going to the grocer.

Less Sensitive — But the real crux of the matter is most likely the fact that the new index will be what the government describes as "less sensitive" to the rise and fall of prices.

The old index used the 1935-39 period as 100. The revised index uses the 1947-49 period as 100.

"Percentage change between any two dates," explains BLS, "will not be affected by this shift in the base period, even though the difference in points between the same two dates will be large."

Translated, this means the new index will be less sensitive, because 1 index point on the new base is the equivalent of 1.67 points on the old base.

Fewer Raises — It means also that there will be less occasion for automatic wage hikes when prices are going up. But, on the other hand, it would mean less basis for pay cuts if prices took a downward path.

One thing is certain. Action won't be postponed for long, whether this consists of requests to BLS to work out conversion formulas, requests for arbitration, demands for renegotiation, or a mixture of all.

The old index, on which virtually all contracts are based, dies with the report for December. This will be announced in January. When the January 1953 index is released in February, it will be on the revised basis.

TOOL, DIE: Leaders See 2 Good Years

Expanding civilian production lines seen taking up any slack from military stretch outs . . . Spokesmen call for education to "glamorize" their industry—*By W. V. Packard.*

Tool and die manufacturers expect business to stay good for 2 years—and perhaps longer. This was the consensus of industry leaders at a special meeting in New York last week.

At the same time they discussed ways and means of restoring "glamor and dignity" to the skills of their trade so that more young men of promise might be attracted.

Spokesmen for about 30 firms attended the sessions, and none voiced pessimism over the business outlook. Other problems, such as manpower and wage and price controls, are causing them a great deal more concern than business volume.

Richard Moore, president, Moore Special Tool Co., Bridgeport, Conn., predicted that "tool and die people are going to be busy for at least 2 or 3 years." He said, regardless of whether or not the Korean war can be soon ended, we are stuck with the basic problem of Russia. He said that the Russians have given no sign they will settle for anything less than world domination . . . that we may have this problem for years . . . "and it is my guess that at least 20 pct of national income must be set aside for defense —unless Russia breaks down internally." "So we must be ready, stay ready, and perfect the best tools of war," he declared.

Mr. Moore also believes one of the greatest problems of our government is to "learn how to buy stuff." He expressed the hope that appointment of C. E. Wilson as Secretary of Defense is a first step in this direction.

Daniel Karpinski of Westlof Tool & Die Co., Detroit, reported his firm is booked full through mid-1953 with tooling orders for 1954 models in auto and appliance industries. He said military cutbacks in the Detroit area would pose little problem, as workers would be readily absorbed on expanding civilian production lines.

Harold Murdock of Arrowsmith Tool & Die Co., Los Angeles, said "defense business has softened somewhat . . . but autos and appliances have taken up the slack." He said he believes enough business is coming along "to take care of us for the next year."

Albert Goldman, vice-president, Atlantic Mfg. Co., Philadelphia, also reported bright prospects in his area. "We should have a couple of busy years," he said.

One of the purposes of the meeting was to approve script for a new movie, *Tool and Die Worker—America's Modern Frontiersman.* The film is to be a key part of the campaign to glamorize the industry. It will be shown to parent teachers associations and to business and civic groups.

The picture, scheduled for completion next spring, will depict the significant role of the tool and die industry in mass production. It will show how youths can gain the equivalent of 4 years' education—and earn money at the same time.

Herbert Murrer of Murrer Tool & Die Co., Cincinnati, called for improvement in educational standards of vocational training. He deplored the low repute of many vocational schools, pointing out that industry had become the dumping ground for some educational systems. He declared that good tool and die makers required IQ's of at least 120. "These are the kind of students we want," he said.

Because of low standards in many vocational schols, Mr. Murrer said, both parents and teachers hesitate to encourage boys to pursue that type of education. Instead they encourage them to seek a classic education — whether they are suited for it or not," he said.

On the brighter side, he told of a $7 million technical school that is being built to accommodate about 3000 students. It is located in an excellent neighborhood, and will have all modern equipment, as well as a sports stadium to seat 16,000. Other examples of outstanding trade schools were cited to show what can be done.

Mr. Murrer urged other members of the Tool & Die Manufacturers Assn. to go back home and "preach the advantages of apprenticeship" in their industry.

MAKE WAY: Last heat of last openhearth at Timken Roller Bearing Co. Furnace was dismantled to make room for complete switch to electrics.

HEALTH: More Care Is Needed

New processes, materials can be medical hazards . . . Study from health standpoint needed . . . Common dangers often overlooked . . . Injury insurance not enough—By G. G. Carr.

It wasn't the company's fault. Management thought it had taken every precaution. The important new postwar product contained beryllium, but protection against fumes had been installed. No one knew at the time that beryllium can cause dangerous growths if it gets into a cut.

Compensation cases, law suits, bad publicity — some of management's worst nightmares — were the result. Today of course the situation has been corrected. But one way or another it cost the company plenty.

Industrial hygiene specialists like to point to this example of the risks of not considering the medical aspects of industry. Mellon Institute's Industrial Hygiene Foundation told THE IRON AGE that far too often a company will adopt a new process or material without checking it from a health standpoint.

This is particularly true now, when new materials are being tried out right and left. Irony is that one plant may be totally unaware of a hazard which is well recognized in another field. Another joker is that a process developed for a large-scale, highly-mechanized plant may be so well enclosed that it's not dangerous until a smaller, less well-equipped shop tries it.

Most industry safety programs are mainly concerned with what the Foundation calls "traumatic" hazards. These are the accident hazards—the unguarded belt, uncovered gears, the unrailed pit.

Other Dangers — Equally dangerous are hazards of toxic compounds, fumes, dust, radiant heat, electrical emanations. Worst part is that the damage from these is frequently more subtle. The least they can do is seriously decrease efficiency. Damage to lungs, blood, kidneys and liver takes longer to show up, is frequently not traced back to the proper source. (The worker may have moved, his family physician may not know the man's working conditions, etc.)

And sometimes the danger may not be known, as with beryllium. In that case the very lack of toxicological literature might have been a warning. In other cases the presence of the danger may not be suspected.

An insecticide manufacturer recently asked the Foundation to check the concentration of two mildly toxic materials in a proposed product. The chemicals turned out to be safe in the amounts used, but the Foundation warned that the proposed binding agent contained enough silica to require special precautions against silicosis. The manufacturer had never considered the "harmless" binder as a hazard.

Well Known—Many of the hazards are in the "everybody knows" category. Everybody knows, or should know by this time, the dangers of lead poisoning. But at least three specialists in the U. S. spend all their time with lead poisoning cases. There's no way of knowing how many cases other doctors are treating.

POTENT ARGUMENT: Iron worker J. W. Stark's hard hat prevented almost certain death when a 26-in. pinch bar dropped 29 ft. Wire mesh reinforcement stopped it after the 3½-lb bar pierced the plastic.

Everybody knows the dangers of benzol, phenol and other widely used chemicals. But unprotected use occurs every day in plants across the country. Carbon tetrachloride is a standout here, warns Dr. Daniel C. Braun, medical director of the Foundation. Everybody knows it shouldn't be used in a confined space because of its suffocating qualities. But its dangerous effect on the human liver is rarely considered. One of our largest manufacturing companies —an exception—won't let the stuff into its plants.

Akin to the "everybody knows" category is the "good housekeeping" school. Industrial dust, for example, is always unpleasant and often dangerous. A heating contractor puts in some blowers, the sweepers look pleased, and all agree the dust problem has been licked.

There's just one trouble: Dust particles big enough to see don't get into the lungs. They're trapped in the upper respiratory system, later blown, coughed, sneezed or spat out. Really harmful particles are invisible. Only way to be sure of eliminating them is to install ventilating machinery to meet specific problems after a scientific air analysis.

Insurance—Many firms leave it up to their insurance companies to worry about health hazards. This thinking ignores the fact that compensation premiums are based on past accident incidence. One firm reports its premium costs dropped 43 pct when a medical department was installed. That saving alone covered almost 60 pct of the total cost of the new department. And insurance companies admit that they can't begin to monitor insured plants.

The comparatively few plants with medical departments are more alive to health hazards. But

even there the doctor may not have the time, facilities, training or encouragement to do an adequate job. Industrial medicine is a teamwork proposition, demanding cooperation from all sections of management and medicine. There's little chance for preventive medicine if management waits for accidents to happen before calling the doctor. And new materials and processes, by their very nature, may require research that no practising physician can do by himself.

Rapidly increasing use of radioactive materials is spurring industry to provide better preventive medical service. Atomic Energy Commission has recently set up a fellowship program in atomic medicine for graduating doctors. And other organizations are taking steps to make such training available. But radiation hazards are just one part of the problem.

Cost—A lot of firms are scared off by the imagined high cost of an industrial medical program. A qualified doctor's salary will run $15,000 to $30,000. And he'll need a nurse, clerical assistance, a budget and equipment

But the program doesn't have to be so elaborate. Consultants are available on a fee basis, and a host of public and private organizations can provide help on various phases. Industrial medicine divisions of state medical boards can be invaluable. Some firms provide specialized training for plant doctors and nurses. And a lot of businesses don't get all the mileage they could from their insurance companies.

Roof Bolting Gains Acceptance

Expanding use of the roof bolting technique for tunnels and mining corridors is bringing greater operating efficiency, conservation of steel, and increased safety.

This is the gist of a new survey by the Bureau of Mines. The agency has been plugging for increased use of roof bolting since 1947 and the survey indicates that the technique now is being used in about 600 coal mines.

FURNACES: See Slight Sales Dip

Makers of industrial furnaces expect a good year in 1953—but it can't reach 1952 volume . . . Backlogs, deliveries shortening . . . Accent heavier on selling—*By K. W. Bennett.*

Industrial furnace manufacturers are girding for another good year. If 1952 has been a "hot" selling year, then 1953 will be only slightly cooler. The competition in some fields will be brisk, but until at least mid-1953 there will be pie for all.

Beyond that point there is considerable mist. Even though furnace deliveries (annealing, normalizing, reducing, etc.), have speeded considerably, a large furnace may take 26 to 30 weeks. A year ago the same furnace would have required 40 to 42 weeks for delivery to be made.

But the buyer, eyeing 1953 with caution, wants his equipment now, or not at all, in an increasing number of cases.

Defense Work Down—There are other factors that veil the future. The extent and possible duration of government buying is one. In the beginning of 1952, the industrial furnace builders were shipping as much as 52 pct of output, on one furnace type, to defense program producers. By the end of 1952 this has changed considerably.

One builder reports that 94 pct of his first quarter 1953 shipments will go into defense building. Another estimates that his defense work is falling, another that it runs below 30 pct of total output, another that he has virtually none.

To the holder of few defense jobs, this means that he has lost a segment of his market that has not been entirely replaced by civilian demand, with the result that he's actually been working into his backlog. The holder of the overly high defense work quota learns that there are further defense cutbacks planned by the armed services. His future planning, too, is apt to have a high percentage of dead reckoning in it.

There is some assurance to be gained from Washington reports that rearmament will continue without any sheer reduction from goals. The new Administration is committed to carry through the defense plans of the old.

See Good Times—It is certain that furnace builders, large and small, are optimistic over sales possibilities in 1953. It is equally certain that 1953 will not be as roaring a year saleswise as was '51. One of the firms contacted reported a dropoff in sales to steel producers beginning at least 4 months ago, and a dropoff in general sales about 2 months back.

Another can trace a general falloff through 1952. This firm began working into its backlog in August of 1951. Some of these backlogs have fallen as much as 15 to 30 pct. The sales manager of a heat-treat furnace firm indicated that he expected 1953 sales to run at least 15 pct below the 1952 figure.

Sales forces are refurbishing, gathering strength for a second quarter or mid-year push. They'll look for markets in automotive, automotive parts, defense, foundries, appliance, electrical machinery, and electrical equipment.

"One minute, Mr. Pringle."

Farm equipment, with one notable exception, has been following the general downtrend in recent selling in the Midwest, though it has held its own in relation to the other industries who buy from the furnace builders.

Basic steel is still a market factor, but there is some feeling that the big steel expansion of 1951-1952 will require a breathing spell, with lessened sales possibilities for the industrial furnace people as a result.

Commercial heat treaters are interested in equipment, but want fast delivery. Which means they will tend to limit themselves to catalogue items that can be delivered in as little as 60 to 90 days. And would have to stay with smaller, lighter furnaces.

Materials — Though furnace manufacturers are not glum over deliveries of raw materials, they are having some trouble. One waits 12 to 16 weeks for deliveries of nickel castings. The same firm, a warehouse buyer, is experiencing considerable difficulty in getting 4 to 7-in. channels and the standard 2 x 2 x ¼-in. angles have been giving some trouble.

Another reports that plate 3/16 and ¼-in. thickness over 54 in. is a really tight item and relief doesn't look promising before third quarter '53. Motor control delivery is bettering, stands at 6 to 8 weeks. Instrumentation delivery, like high nickel content castings, is slower and averages 16 weeks, a large furnace builder reports. The plate buyer purchases at the steel mill level.

Complicating the need is a strong distrust of foreign steels, and considerable dislike for the high prices of conversion steel items. The tight items have not yet been sufficiently tight to force any considerable buying in that quarter, and purchasing agents are reluctant to fall back on such materials.

With demand strong, and backlogs still as much as 9 months, industrial furnace prospects appear very good for '53.

SCRAP: How Safe Are Mill Stockpiles?

They are hefty protection against winter shortage . . No real urgency in buying . . . Shortage warning . . . Dealer stocks slim . . . Price trends if OPS ceilings exit—*By T. Metaxas.*

Last December the steel industry was begging for scrap iron and steel to keep its furnaces melting in the face of a demand for steel just kindled by war. As the winter entered 1952 the scrap shortage verged into crisis. Before imposition of OPS price controls competitive bidding drove prices skyward.

Today the situation is reversed. Scrap consumers will close the year with 6 million tons of scrap in inventory—or an average of 63 days. Because of this record accumulation purchasing agents of mills put no urgency in their buying.

Mill inspectors are sharp-eyed on accepting scrap, seek quality material to hasten melting.

No Reaching — In some areas there is no "reaching" for distant scrap. Mills cut costs by limiting the amount of freight they will pay. Winter thus far has been mild and has not seriously hampered scrap shipments. Meanwhile mills buy enough to keep their stocks fat but have no thoughts of further stockpile building.

Many foundries have indicated they will purchase nothing for the rest of 1952. Their previous purchases have been skimpy, their buying attitude lackadaisical. Cast grades of scrap have been floundering all year long.

Mills are keeping the welcome mat dusted off for good grades of openhearth scrap. This travels at ceiling prices. Some mills are pinched for electric furnace grades. An official of one company recently went to Washington to place his company under the protective umbrella of NPA allocations. The market for blast furnace grades has been creaking along erratically in some scrap areas, somehow managing to cling to price ceilings.

Shortage—Recently Washington warned that a scrap shortage may strike this winter unless collections accelerate. Generally, scrap men see no such possibility even when considering full tilt steelmaking operations well into 1953 and expanding scrap appetites of mills. Their persuasive argument is the hefty state of consumer inventories.

Offsetting these stockpiles is the gaunt condition of dealer inventory. One mill man told THE IRON AGE that after the steel strike dealers started to think in terms of skidding prices. They cleaned themselves out to ship at ceilings. Now that the market has slowed, dealers find it difficult reconstructing yard stocks. Fortified demand later this winter could alter this swiftly.

One scrap man recently visited a plant yard and found up to 100 tons of scrap steel piled up. Eventually the plant owner would sell—but there was no incentive to do so right away.

Winter may later strip mill stockpiles of excess weight. This has not happened yet—primarily because bad weather has not yet clamped its lid on scrap sources or fouled up freight and truck transportation. Scrap is flowing smoothly. More could be prompted to move if demand warranted.

Coasting—But mills are comfortable. Scrap generated within the steel plant continues to yield 50 pct of an openhearth scrap charge. With 2-month inventories consumers can coast along into winter.

Pricewise the scrap market is generally at ceiling—firmly so for good openhearth grades and not so firmly for others. What would happen if the new Administration sacked OPS price controls? First of all many scrap buyers have not tried to crack scrap prices. They have been content to give scrap sources the nourishment of solid prices.

But if price controls were abandoned some grades would rise, others would fall. No. 1 bundles and heavy melting, for instance, would likely gain price strength. Meanwhile, some grades such as blast furnace may slip a notch or so. A realistic market would again be established with traditional price differentials between choice and poorer grades.

Free Market — A free market would pay the right prices to coax

FAST JOB: Indiana's first pre-stressed concrete highway bridge took 3 hr to be put in place. It consists of six 11-ton beams, each 40 ft long x 36 in. wide x 21 in. thick. Each was prestressed by 76 ¼-in. high-tensile strands plus welded wire fabric for stirrup reinforcement.

the right scrap out. It would be a stimulus to collection. But in a crucial shortage born of sudden emergency the right system might bid itself out of existence. Witness the flight of prices shortly before controls on scrap.

What may also work against a shortage is more effective use of greater blast furnace capacity. At least one major steel producer is counting on this pig iron capacity to help stabilize steelmaking costs. If openhearth operations decline to a more normal rate blast furnaces could be operated at a proportionately higher rate. The steelmaker would weigh the cost of this "bonus" iron against the cost of scrap to determine a judicious ratio for the openhearth charge—and still have more protection against a shortage.

Iron ore costs would be influential here.

Assuming that steelmaking barges into 1953 at its record rate and slides somewhat in the second half as demand-supply reach some sort of balance, steel produced in 1953 may total roughly 113 million net tons. Considering castings production purchased scrap needs may be about 35 to 36 million gross tons.

Tonnages—This year the scrap industry turned out over 30 million gross tons despite the long steel strike. For 1953 the industry has the expanded physical plant to exceed this figure and will do so. If later in 1953 a shortage or scarcity impends, scrap drive machinery could be revived to save the situation. Emphasis then may return to autowrecker scrap — always an ace-in-the-hole.

But scrap men feel that with livelier demand will come a considerable quickening of scrap sources. This is a steel country and the amount of scrap that can be unearthed when needed is prodigious, they say. They feel that they can do the full job of supplying scrap users in 1953. If the situation gets desperate they would welcome scrap campaign help.

Belt Sharpens Carbide Tools

Sharpening costs of tungsten carbide tools can be cut about 66 pct by a method developed jointly by Behr-Manning Corp., Troy, N. Y., and Fenlind Engineering Co., Rockford, Ill. Eliminating the conventional diamond grinding wheel, the method uses a waterproof silicon carbide paper belt driven by a 14-in. cast iron contact wheel.

ADJUSTING: Work table is raised until point of the tool reaches proper angle marking on the calibrating post.

Field tests by Behr-Manning show that belt costs for carbide tool bits range from 1¢ to 3¢ per tool. The conventional method runs 6¢ to 17¢. In addition, the 220-grit belt eliminates two operations, intermediate grinding and finish-honing. A finish of 2-16 micro-in. rms is put on the tool by the belt.

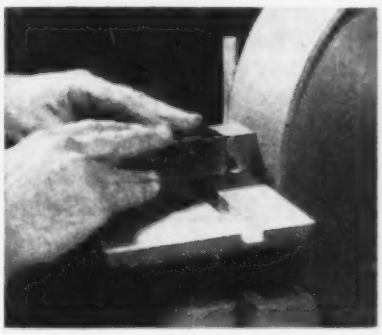
Working life of tools sharpened by this method is reported to be about doubled. In one test, turning 5665 nickel alloy, diamond wheel sharpened tools averaged 12 pieces per tool. Belt sharpened averaged 34 pieces. In another test on AMS 5060, wheel sharpened tools turned out 120 pieces, belt ground cutters 202 1/3 pieces.

Grinder, the Fenlind Micro-Finisher, features an adjustable work table to permit any normal relief angle to be micro-finished on the cutting tool.

The relief angle is set by adjusting the height of the table until the face of the cutting tool contacts the belt on the periphery of the contact wheel at a point on its curvature that corresponds to the angle desired. A vertical gage, marked in degrees from 1 to 22, is mounted near the table at the left of the wheel. Proper table height is established for a desired relief angle by aligning the cutting edge of the carbide tip with the correct angle marking on the vertical gage.

As another feature, Behr-Manning claims that the belt finish does not produce chipping on the cutting edge of the tool that must be honed off with a diamond hone when carbide tipped tools are sharpened by conventional methods.

Sharpening with the belt involves two steps. First the clearance angle is rough ground with a silicon carbide grinding wheel. Then both front and side relief angles are micro-finished on the belt, the table having been set at the correct angle. The nose angle is micro-finished by swinging the tool through approximately a 90° arc.



GRINDING: Relief angle is produced by curvature of contact wheel at a point corresponding to angle marked on calibrated post.

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GALVANIZERS: Expect Sales Jump

Zinc is no problem but steel is still tight . . . Sales are spotty now—galvanizers call it "year-end lull" . . . Swing to continuous galvanizing gathering steam—By R. M. Lorz.

The zinc shortage which plagued producers of galvanized products last spring has been erased by the steel strike and a tumbling price structure. Lifting of allocations last May and return of Prime Western zinc have pushed the cycle from famine to plenty.

When the steel strike ended last July the zinc industry had nearly 100,000 tons of the metal on hand. Stockpile has decreased to about 80,000 tons now—but galvanizers have quit worrying about zinc.

Brief glance at current market price on zinc is enough to confirm easy feeling about supplies. In October of 1951 zinc was quoted at 19½¢ per lb, the ceiling. Since then price has skidded to 12½¢ and could go even lower if free trading on the London market isn't controlled after January second.

Need Steel, Sales — Currently galvanized producers are more concerned about tight steel supply and spotty year-end sales than anything else. Since they shoulder the year-end lag with industry in general, galvanizers aren't too concerned and expect to do a good business through the first half of next year.

At present galvanized wire mill products are in good balance and are moving fairly well. Fencing and barbed wire—the only really slow items—are to some extent seasonal and can't be accepted as an accurate barometer. Another segment of the agricultural market—the poultry industry—is reported to be buying at a healthy rate.

Sheet sales have fallen off and the drop has been more pronounced in lighter 18 to 28 gage runs. Demand for heavier 10 to 18 gage items is still good. Corrugated siding sheets are also easy to market.

Consumers in sheet metal, construction, furnace and sign making trades are well supplied and aren't going on any buying sprees right now. Suppliers believe that the picture will improve after the first of the year.

Want More—Warehousemen are stocking a better product mix in galvanized every day but still want to improve their position a great deal. Some complain that optimistic steel predictions have eased the scramble and cut into orders. On an industry-wide level galvanized products just aren't moving as well as they were 6 months ago.

Continuous galvanizing lines are getting more and more attention on the production front as mills get set to do a good business next year. Although continuous production accounts for only 5 pct of overall output, there is a steady swing from conventional hot dipping to continuous methods.

At the moment sizable installation costs are an obstacle to most mills but those already in continuous production are enthusiastic about breaking down cost barriers. Increased production is a standard argument. According to users, continuous lines average 10 tons an hour while conventional hot dip operations average 2 to 3 tons hourly on light gage material and 7 to 8 tons on heavier runs.

Who's Right?—Which produces a better all-purpose coating, hot dipping or continuous?

There is some argument here but authorities generally believe better bonding and greater ductility win the day for the continuous process. Those who argue for the newer process admit that zinc-iron alloys will give better results in the Priest test but add that the test is misleading. Pure zinc will dissolve twice as rapidly under testing but many authorities point out that rapid dissolution has no bearing on the protective merit of the continuous coat.

Greater ductility is also a selling point for the continuous process since it allows more latitude for forming such as deep drawing. The shift probably won't be rapid but it is under way. One fairly large mill has two-thirds of its galvanized production on the continuous line and expects to drop hot dipping completely in the near future. Two new lines for Sendzimir process galvanized sheet are also planned for Canada and the Midwest.

"Everybody in advertising has ulcers."

IMC to Ration Moly, Nickel

Continued high requirements for molybdenum and primary nickel necessitate distribution plans for first quarter 1953, according to International Materials Conference, which has announced discontinuance of tungsten allocations.

Recommended by IMC is apportionment of 6408 metric tons of molybdenum ores, concentrates, and primary products. The U. S. share is 4833 tons of ores and concentrates, and authorization to export 166 tons of products. Some 25 other Free World areas are listed in the allotment plan.

A total of 37,272 metric tons of nickel-content materials have been placed on the proposed distribution list, with the U. S. scheduled to get 25,013 tons. IMC says the recommended allocation is "considerably short of requirements."

On the other hand, supply of and demand for tungsten are reported as about in balance. This material was first allocated for the third quarter 1951 when actual production amounted to about 3150 tons of tungsten content.

In first quarter '53, output is expected to top 4700 tons.

Sweden's Iron Ore

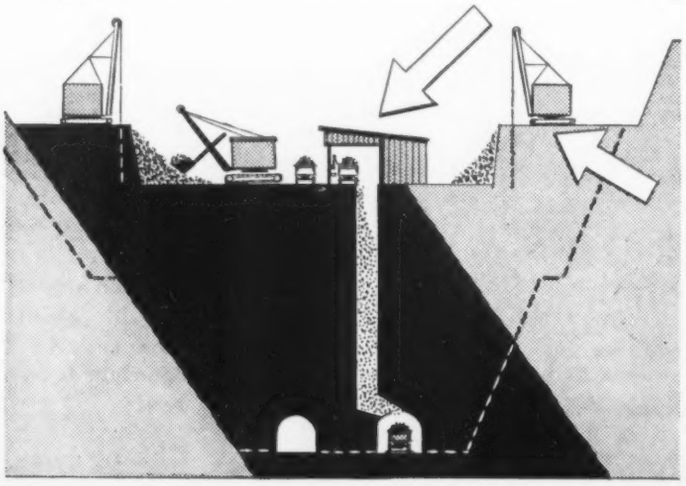
Snow and ice cover some of the world's richest iron ore deposits for 7 months of the year. Ore found at Kiruna, Sweden, about 870 miles north of Stockholm, runs 60 to 70 pct Fe. Yearly output is now above 8.5 million tons. Mined ore is shipped to Narvik, Norway, for transshipment. Mines are being converted from open pit to underground as shafts go deeper into the mountains.

The U. S. is a long-term importer of Swedish ore. Germany in the postwar period has been particularly eager to import it. Inability of Germany to provide quotas of coal in trade for ore has hampered its imports. This ore is the base for many high quality steels made by the Swedes.

IRON MOUNTAIN: Excavation on Kirunavaara Ridge, one of two mountains yielding ore with a 60 to 70 pct iron content.

ORE HANDLING: Cars carrying ore from pits are unloaded at upper end of shaft. Ore is broken, dropped to underground rail system.

STEPS: Closer view of Kirunavaara Ridge showing snow covered shelves. Snow and ice prevail during 7 months of the year at this location about 90 miles above the Arctic Circle.



Schematic shows flow of ore through breaker to underground railroad.

IRON DIET: Drilling rigs with 1½-ton borers bite holes in very hard ore at 3 ft per hr rate.

QUOTAS:

Second quarter allocations raise hope of open-ending some items.

Strong possibility that some types of steel forms and shapes may be "open-ended" under CMP for the second quarter is now under active discussion at National Production Authority. Sheet and strip are likely candidates for action under present plans.

This possibility loomed as NPA last week announced its initial second quarter allocations of controlled materials, basing its steel allotments on an expected increased production of more than 1 million tons.

Second quarter estimate for carbon steel production is just short of 21 million tons. As far as plate, heavy structurals, and nickel stainless are concerned, NPA says requirements are still 137,156, and 145 pct of supply, respectively.

But after meeting all defense and atomic energy requirements, the agency figures it can release to manufacturers of civilian type goods something like 70 pct of their steel needs.

More Later—If the pattern for previous quarters still holds good, it is likely that substantial supplementary steel allotments can later be made available. This will depend upon the amount of open space on mill books after the first batch of CMP tickets is cashed.

In addition to improving steel outlook, the Defense Dept. found that it could do with 10 pct less steel than it claimed for first quarter. But it needs more plate.

Officials said they believed the supply available for allotment to the automobile industry would permit production of about 1.25 million passenger cars and 315,000 trucks. Unit ceilings had been established earlier at 1.5 million cars and 325,000 trucks and tractors—if the industry could find the extra materials to produce them.

Second quarter allocations for the freight car program are on a basis of 27,000 units for the period. This is the first time since CMP went into effect that car builders have been given allotments on a 9000-units-a-month basis.

Roads — Highway allocations were at a level calculated to permit the highest construction rate since the war. Full use of the self-certification rules which go into effect on Jan. 1 should boost the rate to the highest in history, officials said.

On the other hand, copper supplies are now estimated to be slightly less than the program supply for first and previous quarters. Officials say requirements are still running about 140 pct above the estimated supply of 670,000 tons.

Steel, Copper, Aluminum Allocations

First, Second Quarters, 1953

	Total Steel (tons)		Total Copper (000 lb)		Aluminum (000 lb)	
	1st Qtr. 1953[1]	2d Qtr. 1953[2]	1st Qtr. 1953[1]	2d Qtr. 1953[2]	1st Qtr. 1953[1]	2d Qtr. 1953[2]
Supply	22,157,000	22,778,250	1,270,000	1,340,000	721,000	706,000
Pct of Supply	86.8	114.9	127.3	119.7	121.0	119.2
General Claimants	5,739,189	6,435,313	416,618	405,771	319,892	297,107
Agriculture Dept.	32,973	34,070	633	910	45	70
Army Dept.	25,373	29,258	1,296	1,512	70	20
Atomic Energy Commission	245,851	263,526	6,256	5,990	6,153	5,590
Civil Aeronautics Admin.	12,325	17,124	540	575	416	497
Defense Dept.	2,204,500	2,065,500	[5]299,580	[5]290,081	252,000	230,000
Defense Electric Power Admin.	221,248	289,935	62,032	64,980	50,000	48,500
Defense Fisheries Admin.	357	509	25	25	4	4
Defense Mat'ls Proc. Agency	60,681	60,581	1,988	1,617	350	280
Defense Solid Fuels Admin.:						
Coal Mine Construction	8,640	10,030	410	310	25	30
Coke Oven Construction	18,898	22,253	354	335	2	10
Defense Transport Admin.	63,098	74,850	2,319	1,780	140	70
Federal Civic Defense Admin.	4,400	340	28	12	10	10
Federal Security Agency:						
Education	109,381	116,785	5,874	4,400	230	195
Hospitals	56,574	74,140	3,768	3,245	390	278
General Services Admin.	18,002	23,535	3,777	4,315	98	155
Housing & Home Finance Agency	62,870	43,000	3,280	2,250	10	.....
Interior Dept.	5,808	10,003	80	114	9	10
Maritime Admin.	95,715	125,500	1,712	1,904	82	100
OIT—MSA	624,272	946,727	12,328	11,785	8,000	8,750
Petroleum Admin. for Defense	1,556,894	1,909,136	8,752	7,755	1,700	1,280
Public Roads, Bureau of	305,164	372,508	980	1,106	130	200
Veterans Admin.	6,165	6,205	604	770	28	60
National Production Authority	11,298,354	15,285,145	1,038,091	945,310	455,326	379,779
Agricultural Mach. & Impl.	376,501	593,722	9,809	8,904	13,806	11,123
Aircraft-Ordnance & Shipbuilding	100,541	135,334	15,514	14,256	11,537	10,604
Aluminum & Magnesium	.....	.....	.....	.....	650	1,250
Building Materials	600,713	792,985	75,122	82,249	87,261	71,481
Canadian	385,600	609,525	2,995	2,995	3,066	3,175
Chemical	247	59	1,863	1,468	697	317
Communications Equipment	34,422	46,825	57,832	50,034	3,701	3,884
Construction Machinery	357,813	580,393	7,370	6,601	2,780	2,144
Consumer Durable Goods	631,442	751,968	57,450	49,900	83,372	72,963
Containers & Packaging	1,499,134	1,631,807	432	369	9,033	8,698
Copper	24,630	[3]	3,615	[3]	1,975	[3]
Electrical Equipment	437,792	597,253	163,328	152,050	31,850	25,850
Electronics	56,464	55,461	29,588	22,657	12,734	9,372
Engine & Turbine	416,739	606,114	28,891	25,850	3,091	2,700
Facilities Bureau[4]	630,762	765,642	24,468	23,070	7,970	7,306
General Components	856,314	954,318	183,287	157,462	22,600	18,278
General Industrial Equipment	407,627	410,167	51,119	38,969	24,090	15,405
Iron & Steel	110,043	168,170	5,296	5,080	110	140
Leather & Leather Products	7,550	3,164	1,449	1,984	1,028	706
Lumber & Wood Products	4,033	2,691	156	84	855	686
Metalworking Equipment	399,948	344,324	29,250	21,431	8,982	4,600
Mining Machinery	93,731	121,716	3,520	2,967	198	91
Misc. Metals & Minerals	2,488	2,539	3,035	2,795	83	12
Motion Picture-Photo. Products	5,202	3,029	1,278	820	3,101	1,106
Motor Vehicle	2,421,370	3,620,260	127,446	132,843	77,637	75,425
Printing & Publishing	5,530	1,114	1,175	1,157	414	164
Pulp, Paper & Paperboard	501	[3]	30	[3]	57	[3]
Railroad Equipment	1,103,612	1,951,961	83,450	77,822	4,735	5,858
Rubber	22,839	23,478	3,503	3,857	825	868
Scientific & Tech. Equip.	39,017	43,611	43,548	39,396	14,379	10,855
Service Equipment	158,663	167,215	8,372	6,140	11,190	6,720
NPA Reserve (General)	47,135	225,250	9,385	11,000	7,509	5,000
NPA Hardship Cases	59,951	55,050	4,519	4,000	4,000	3,000
Total—All Claimants	17,037,543	21,720,458	1,454,707	1,351,081	775,218	676,886
MRO-Self-Cert., Self-Allot.	2,117,063	3,822,898	134,271	242,002	81,877	159,718
DPA Reserve for Prog. Adjust.	83,481	624,131	28,180	11,285	15,230	4,995
GRAND TOTAL	19,238,087	26,167,487	1,617,158	1,604,368	872,325	841,599

[1] As of Dec. 12, 1952.
[2] Original allotments.
[3] Included in MRO-Self-Certification, Self-Allotment.
[4] Includes construction controls, industrial expansion, and water resources.
[5] Includes sheet and strip weight for copper brass mill.

Industry Controls This Week

Alloys—Amend. 4, Rev. 1, SR 100, GCPR prohibits producers of metal alloys containing less than 50 pct iron or steel from increasing ceiling prices under provisions of SR 100, GCPR.

Aluminum, Copper, Steel—Amend. 3, GOR 35 permits a manufacturer using steel, aluminum or copper in his product to increase ceiling prices to reflect the increased cost of metal resulting from specified applicable regulations for which he has not previously received an adjustment. Amend. 4, GOR 35 adds metal caps and home canning closures to the items on which pass-throughs for steel, pig iron, copper and aluminum cost increases are allowed.

Coal—Amend. 3 CPR 3 increases ceiling prices on bituminous coal to allow for the recent $1.90 per day wage increase. The order covers bituminous coal, lignite and Virginia anthracite, delivered from mines or preparation plants.

Copper—Amend. 2, CPR 68 boosts prices for producers of certain specified copper and copper base alloy seamless tubes. Copper water tubes, oil burner tubes and brass and copper and condenser tubes are not covered in the price increase order.

Manufacturers—Interp. 23, CPR 30 and Interp. 36, CPR 22 state that manufacturers will not be allowed to use cost increases resulting from dislocations in sources of supply for allocated materials as a basis for computing materials cost adjustments under any provision of CPR 22 or CPR 30. An exception is allowed when sources of conversion steel are considered.

Metal Caps—SR 128, GCPR adjusts ceiling prices for manufacturers of

Metal Stampers—Amend 3, CPR 119 exempts from coverage under CPR 119 manufacturers of mechanical precision springs, metal stampings and screw machine products whose annual gross sales are not more than $25,000.

Nickel—Amend. Sched. A, M-80 requires purchasers of high nickel alloys to make certification of end use when buying from suppliers.

Steel—Sched. 5, M-6A requires steel distributors to obtain certificates from customers stating the nickel bearing stainless would be used only in conformance with existing and use restrictions.

Government Inviting Bids

Latest proposed Federal procurements, listed by item, quantity, invitation No. or proposal and opening date. (Invitations for Bid numbers are followed by "B", requests for proposals or quotations by "Q.")

Springfield Armory, Springfield, Mass.
Part for gun machine, calibre .50, 30000 ea, 53-135B, Dec. 29.
Hider, flash, calibre .50, 30000 ea, 53-135B, Dec. 29.

Wilkins Air Force Depot, Shelby, Ohio.
Jack, axle, hydraulic, 285 ea, (Not Furnished).

Corps of Engineers, Chicago.
Compressor, air, portable gasoline driven, 16 CFM, for inflating boats and floats, 253 ea, B-234B, Jan. 13.

Ordnance Tank Automotive Center, Detroit.
Wrench, 2422, 53-743B, Jan. 5.
Wrench oil press sending unit, 1026, 53-743B, Jan. 5.
Wrench plug straight bar, 520, 53-743B, Jan. 5.
Wrenches socket detachable, 1016, 53-743B, Jan. 5.
Wrench tubular single end, 347, 53-743B, Jan. 5.
Wrench crowfoot, 820, 53-743B, Jan. 5.
Wrench open end, 401, 53-743B, Jan. 5.
Wrench clutch ball adjusting, 100, 53-743B, Jan. 5.
Brake hand assy, 600, 53-792B, Jan. 19.
Cylinder whl front brake assy, 26000, 53-792B, Jan. 19.
Lever actuating, 2000, 53-792B, Jan. 19.
Kit repair hand lever parking, 2500, 53-792B, Jan. 19.
Weight assy distributor, 6000, 53-828B, Jan. 8.
Bearing set, 12000, 53-337B, Jan. 5.
Absorber shock R front assy, 1000, 53-776B, Jan. 5.
Absorber shock R front assy, 10000, 53-776B, Jan. 5.
Carburetor assy, 2000, 53-728B, Jan. 5.
Kit repair carb, 700, 53-728B, Jan. 5.
Bearing needle open end, 9500, 53-644B, Jan. 5.

Watervliet Arsenal, Watervliet, N. Y.
Alloy steel holder, parts for 40 MM gun M1, 1200 ea, 53-61B, Jan. 9.
Steel pin, parts for 40MM gun, 5000 ea, 53-61B, Jan. 9.
Steel lever, parts for 40MM gun M2, 125 ea, 53-61B, Jan. 9.
Steel case assy, parts for 40MM gun M2, 500 ea, 53-61B, Jan. 9.

Corps of Engineers, Pittsburgh.
Gate valve section, 302 ea, ENG-36-058-53-124B, Dec. 30.
Gate valve section, portable, 600 ea, ENG-36-058-53-124B, Dec. 30.
Plug valve section, 374 ea, ENG-36-058-53-124B, Dec. 30.
Valve, steel, 118 ea, ENG-36-058-53-124B, Dec. 30.
Valve, iron, 127 ea, ENG-36-058-53-124B, Dec. 30.
Valve, semisteel, 250 ea, ENG-36-058-53-124B, Dec. 30.
Hangars and tracks, sliding doors, 716 set, ENG-36-058-53-123B, Dec. 29.

Small Arms Ammunition Center, St. Louis.
Clip CTG carbine cal. .30, 49815430, ORD-23-196-53-4B, Jan. 15.
Shell shotgun 12 ga, 11000 m, ORD-23-196-53-3B, Jan. 15.
CTG bal cal. .22 long rifle, 50270 m, ORD-23-196-53-3B, Jan. 15.

Navy Purchasing Office, Washington.
Machine, dishwashing with 196 sets onboard repair parts, 196, 6208S, Jan. 8.
Drills, electric, portable, 268, 6842B, Dec. 31.
Wrenches, closed detachable, 5418, 6839B, Dec. 31.
Torches, soldering, brazing, 912, 6845B, Jan. 2.
Wheels, power driven steel wire brushes, 10000, 6847B, Dec. 31.

Rock Island Arsenal, Rock Island, Ill.
Cylinder gyro stabilizer, 230 ea, 11-070-53-394B, Jan. 8.
Castings high physical alloy steel, 10 ton min., 11-070-42-293B, Jan. 8.

Frankford Arsenal, Philadelphia.
Compass, 5790 to 6700, ORD-53-SP-232, Jan. 12.

Ammunition Center, Joliet, Ill.
Signal flash and sound M74, 1419673 ea, ORD-11-173-53-44B, Jan. 8.

Corps of Engineers, Philadelphia.
Fan, air circulating, 1103, ENG-36-109-53-301B, Dec. 23.
Cylinder, gas, empty, 821, ENG-36-109-53-316B, Jan. 2.
Cylinder, gas, empty, 4055, ENG-36-109-53-323B, Jan. 2.
Connector, cable, slotted bolt type, 170258, ENG-36-109-53-325B, Jan. 2.

Quartermaster Depot, Chicago.
Ladles, 1238 ea, 53-84Q, Jan. 7.
Boiler double, 2589 ea, 53-84Q, Jan. 7.

Contracts Reported Last Week

Including description, quantity, dollar values, contractor and address. Italics indicate small business representatives.

Shell, HE, 155 MM, M 107, metal parts, 96642, $1,870,022, C. A. Dunham Co., Chicago.
Shell, HE, 155 MM, M 107, metal parts, 653358, $12,809,606, C. A. Dunham Co., Chicago.
Spare parts, var, $25,250, Ingersoll Rand Co., Chicago.
Spare parts, var, $114,501, Barber Green Co., Aurora, Ill.
Spare parts, var, $66,140, Caterpillar Tractor Co., Peoria, Ill.
Spare parts, var, $35,941, International Harvester Co., Melrose Park, Ill.
Spare parts, var, $125,697, R. G. LeTourneau, Inc., Peoria, Ill.
Booster, M21A4, $40000 ea, $735,000, Lincoln Engineering Co., St. Louis.
Indicator, 504 ea, $28,713, The Lewis Engineering Co., Naugatuck, Conn.
Gaging device, 3200 ea, $42,687, Scovill Mfg. Co., Inc., Brooklyn.
Relay assy, 2700 ea, $65,772, Collins Radio Co., New York.
Parts for maintenance of propeller installation, var, $192,440, United Aircraft Corp., East Hartford, Conn., *Adam C. Wolz.*
Maintenance and overhaul parts for turbo-jet engines, var, $1,329,500, United Aircraft Corp., East Hartford, Conn., *E. E. Champion.*
Maintenance and spare parts for P&W engines, var, $4,665,261, United Aircraft Corp., East Hartford, Conn., *E. E. Champion.*
Adapter assy, 15400, $31,570, Air-Lock, Inc., Milford, Conn.
Hydraulic motor assy, 547 ea, $184,989, Vickers, Inc., Detroit, *R. M. McCabe.*
Swivel joint, filter assy, var, $69,067, Hydro-Aire, Inc., Burbank, Calif.
Actuator, 177 ea, $202,881, Western Gear Works, Lynwood, Calif.
Spare parts for P&W engines, var, $29,648, United Aircraft Corp., East Hartford, Conn., *E. E. Champion.*
Parts for propeller and deicer installation, var, $254,520, United Aircraft Corp., East Hartford, Conn., *Adam C. Wolz.*
Maintenance parts for air conditioning system, var, $33,378, United Aircraft Corp., East Hartford, Conn., *Adam C. Wolz.*
Engine maintenance spare parts, 1000 ea, $254,520, United Aircraft Corp., East Hartford, Conn., *E. E. Champion.*
Stand, 60 ea, $125,802, United Aircraft Corp., East Hartford, Conn., *E. E. Champion.*
Spare parts for use on P&W engines, var, $322,586, United Aircraft Corp., East Hartford, Conn., *E. E. Champion.*
Support assy, 266 ea, $30,901, United Aircraft Corp., East Hartford, Conn., *E. E. Champion.*
Maintenance parts for pump assys, var, $218,111, Vickers, Inc., Detroit, *R. M. McCabe.*
Pump, hydraulic engine driven, 357 ea, $196,673, Vickers, Inc., Detroit, *R. M. McCabe.*
Wheel assy, var, $99,739, Aerol Co., Inc., Los Angeles.
Engine cover, 249 ea, $77,058, New Castle Products, Inc., New Castle, Ind.
Maintenance parts for F7U-3,3P aircraft, var, $56,222, The Goodyear Tire & Rubber Co., Akron.
Wheel assy, var, $33,287, The Goodyear Tire & Rubber Co., Inc., Akron.
Valve and thermostat assys, var, $64,928, Airesearch Mfg. Co., Los Angeles, *James B. Meuer.*

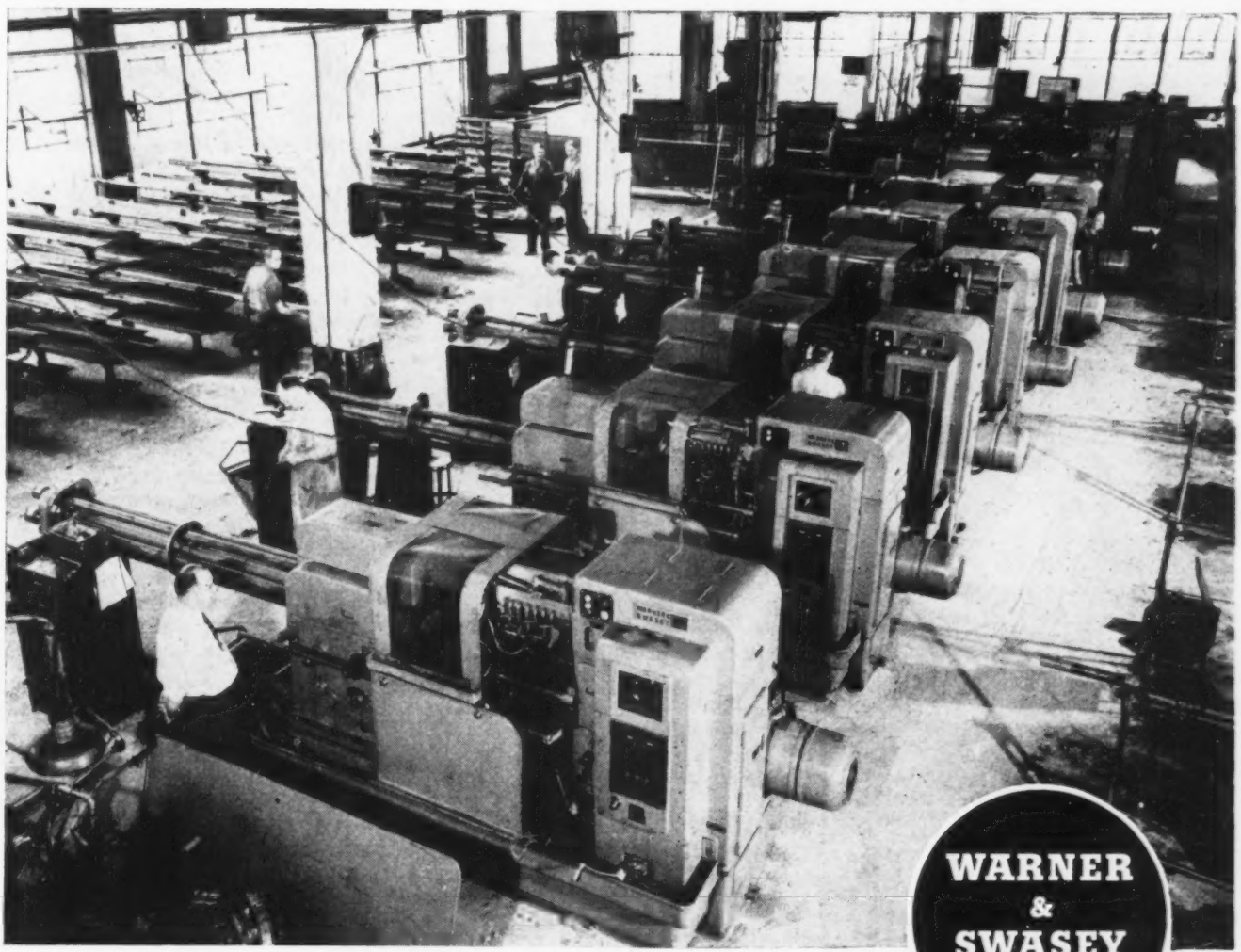
Modernization pays off!

6 MACHINES NOW DO THE WORK OF 17

● As part of their modernization program, Otis Elevator Company replaced 17 machines with 6 Warner & Swasey 5-spindle Automatics. These automatics are used at Otis for short runs on specially-machined parts—studs, bolts, nuts and other screw machine products—required for custom-made elevators.

The results of this modernization program: increased production in less floor space, more uniform parts, and six critically needed men released for work elsewhere in the plant. At Otis only 3 men are required to set up and operate these 6 automatics.

Because of its quick setup and ease of operation, the Warner & Swasey 5-spindle Automatic makes automatic production economical on short runs as well as large lots. It's a machine designed to meet the requirements for lasting accuracy and increased production for the years ahead.



The Warner & Swasey 5-Spindle Automatic line at the Yonkers Works of the Otis Elevator Company.

WARNER & SWASEY
Cleveland

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY MACHINE TOOLS, TEXTILE MACHINERY, CONSTRUCTION MACHINERY

Industrial Briefs

Season Closed — THE BRADLEY TRANSPORTATION LINE of U. S. Steel's Michigan Limestone Div., which closed its 1952 shipping season this month, carried a total of 7,961,000 net tons of limestone this year.

Big Step—The lighting of PITTSBURGH COKE & CHEMICAL CO.'s new $8 million blast furnace at Neville Island marks the completion of another big step in the company's $34 million postwar expansion program.

Scholarship Established—THE RUST ENGINEERING CO., Pittsburgh, has established a scholarship fund at Lehigh University with a gift of $25,000. The income from this fund is to be used for one or more students in engineering. The scholarship is to be known as The Rust Engineering Company Fund.

Changes Name—Wheeler-Brady Inc., 15017 Detroit Ave., Cleveland, has changed its name to WHEELER ASSOCIATES, INC., and Robert Brady, coordinator of Client Service, has resigned.

Representative Appointed—PENINSULAR MACHINERY CO., Detroit, has been appointed Michigan representative for Hydraulic Machinery Div., Watson-Stillman Co.

Erected — LURIA ENGINEERING CO., Bethlehem, has erected a new manufacturing and storage plant at Meadville, Pa., for Westinghouse Electric Corp.

Visiting Experts — Recently seven sheet metal fabricating experts from West Germany visited the Chicago plant of CLEARING MACHINE CORP. to see how big metal forming presses are designed and manufactured. The visit was one feature of a study trip sponsored by the Mutual Security Agency's technical assistance program.

Trained Welders — EUTECTIC WELDING INSTITUTE, Flushing, N. Y., and its new West Coast branch trained a total of 562 advanced welders in 1952. A new term starts Jan. 13, 1953.

Barrel Finishing Company—METAL FINISH, INC., Newark, N. J., has opened a new barrel finishing company to serve the East Coast area. Paul E. Kirchartz is president of the firm.

New Position — ALLOY CASTING INSTITUTE, New York, has created the new position of executive vice-president. Ernest A. Schoefer will fill the new post.

Pay Bonus—THE LINCOLN ELECTRIC CO., Cleveland, paid 1208 employees their 19th annual year-end incentive pay bonus, based on the company's productivity for the year.

New Record—The number of WESTINGHOUSE ELECTRIC CORP. employees who now own common stock in the company has reached the new record total of 29,503.

Course Offered—TRACERLAB, INC., 130 High St., Boston, is offering an intensive 2-day training course designed to provide the basic knowledge needed to utilize Cobalt-60 sources in industrial radiography.

New Representative — DeBothezat Fans Div., AMERICAN MACHINE & METALS, INC., East Moline, Ill., has appointed H. S. McKenzie Co. its representative in Oregon and southern Washington.

Expansion Planned—PACIFIC CAN CO., San Francisco, plans a $2.8 million, 2-billion-can-capacity plant at Santa Clara, Calif.

Established — HARMAN-KARDON, INC., 52 W. Houston St., New York, has been established as successors to Kardon Mfg. Corp. Sidney Harman is general manager.

Starting Quarter Century—The new year will mark the start of a quarter century of carbide manufacturing for the Carboloy Dept., GENERAL ELECTRIC CO., Detroit.

Organized — BACON INDUSTRIES, INC., has been organized to produce O-Rings, gaskets and similar specialty products. The manufacturing facilities of the new organization are at 192 Pleasant St. in Watertown, Mass.

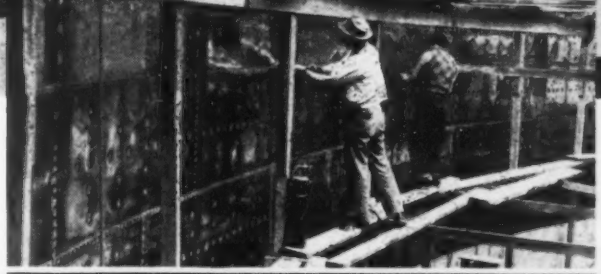
Elected Chairman—Dr. Christopher E. Barthel, Jr., assistant director, Armour Research Foundation, ILLINOIS INSTITUTE OF TECHNOLOGY, Chicago, was elected chairman of the board of directors of the National Electronics Conference.

COPPER

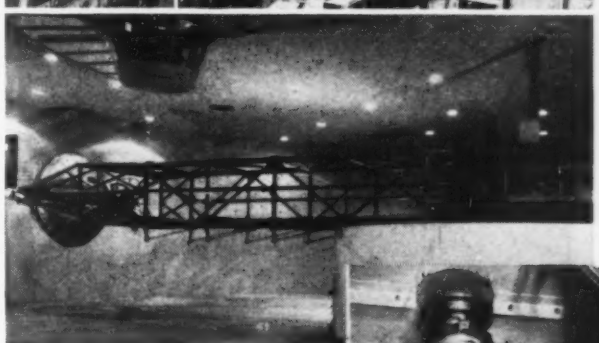
can insulate as well as conduct!

Aviation Medical Acceleration Laboratory, U. S. Naval Air Development Center, Johnsville, Pa.

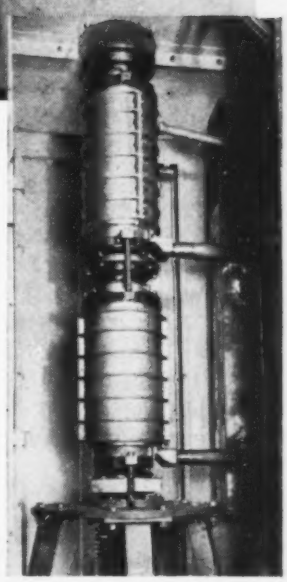
The fact that copper has the highest electrical conductivity of all the commercial metals not only makes it the preferred metal for carrying current, but also results in its adoption for shielding. Electrical and electro-magnetic disturbances, currents and fields cannot pass through a grounded shield of copper sheet. In this sense, then, copper becomes an insulator. It is widely used for this purpose in laboratories, to assure the accuracy of delicate instruments. A recent spectacular example of such an application is in the Aviation Medical Acceleration Laboratory of the U. S. Naval Air Development Center, Johnsville, Pa. The purpose of the Centrifuge is to test the tolerances of men and animals to the types of acceleration and deceleration produced in military aircraft and to study the physiological conditions which set limits to such tolerances. Recording instruments attached to the subjects are extremely sensitive, but thorough shielding by sheet copper makes it possible to record brain waves without amplification . . . Revere will gladly collaborate with you on scientific and industrial applications of copper and its alloys, and aluminum alloys. See the nearest Revere Sales Office.



Revere Sheet Copper shielding being installed on wall of the Centrifuge chamber by The Howard P. Foley Co., Electrical Contractor, 1630 Pine St., Philadelphia 3, Pa.



A view of the human centrifuge itself. This can produce positive, negative or transverse "G", through accelerations up to 40 times the force of gravity. A great many records are made of each test, including X-ray motion pictures. The subject is observed continually by television.



Upper slip-ring stack—physiological, signal and power. Here copper serves as a conductor.

Official Photographs from U. S. Navy

REVERE

COPPER AND BRASS INCORPORATED

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Mills: Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N. Y.— Sales Offices in Principal Cities, Distributors Everywhere

SEE REVERE'S "MEET THE PRESS" ON NBC TELEVISION EVERY SUNDAY

Ford Meets Chevrolet for '53 Title

Fight for sales, production championship to start soon . . . Prelim with NPA gave publicity edge to Ford as challenger . . . Chevvy's strong punch is new style—*By R. D. Raddant.*

Chevrolet, wearing the laurels of the champion, and Ford, the leading contender, are ready to come out fighting for the 1953 title.

There will be a lot of rough fighting, possibly a little gouging before it's over. But, while an upset is always possible, here is how the smart money has it figured out.

Chevrolet will retain its top sales and production position. Ford will consolidate in terms of production some of the gains made in prestige during the past year.

That Ford did make substantial gains during 1952 is questioned only by extreme Chevrolet partisans. Ford had a completely restyled car, and one the public found very much to its liking. What it would have done in a free market is, of course, uncertain. Production quotas tied both Ford and Chevrolet to percentages of base periods, prevented a fair test.

Unable to produce beyond allotments, Ford used National Production Authority itself as a sounding board, stressing again and again before NPA committees what a great car it had in its 1952 model. While it gained no additional steel for production, Ford's statements had a terrific publicity value.

How They Look—This is how the two contenders measure up on the eve of the fight. Ford has already shown its 1953 car. It is not greatly changed from the 1952 model. But, this model was considered one of the best advances in recent years and radical changes should not be necessary.

Chevrolet has not yet shown its 1953 car and, following its traditional security policy, has permitted few outsiders to view it. Those who have are pledged in blood not to reveal the tiniest detail.

It can be stated that it is an excellent car in appearance and performance. Probably only in matters of personal taste and preference is one superior to the other, although spokesmen for each would deny this vigorously.

New Look—Chevrolet may have the psychological advantage of a new styling. Chevrolet sales people are confident they have the edge in timing their restyled car for the free market expected in 1953.

W. E. Fish, Chevrolet's general sales manager, last week told a group of automotive writers that Chevrolet intends to sell 1,100,000 passenger cars in 1953. The 1952 total will be approximately 889,476.

Ford has not stated its actual goals other than a substantial improvement over 1952 when about 780,205 new Fords rolled onto the highways.

Mr. Fish stated flatly that Chevrolet had "no thought of underestimating the competition, but also no intention of overestimating it on the basis of what we have heard." This referred pointedly to Ford claims made before NPA and elsewhere during the past year.

Sales, Not Output—As Mr. Fish put it, "Chevrolet just keeps on sawing wood and at the end of the year points to the record." It is his conviction that in 1953 totals will be based on "who can sell them rather than who can build them."

But Ford has greatly strengthened its competitive situation in recent years and is not talking just for vocal effect. Ford's vast expansion of completely new and automated plants is being completed at a time when they can be best utilized in the free competition expected in the next few months.

Ford has completely revitalized its organization under Henry Ford II and Ernest R. Breech and has completely revamped and improved production facilities. Ford is also ready for the bell and comes out with confidence.

Did Well—Market players who held onto their automotive stocks during 1952 did very well.

Motor stocks generally climbed during the year and several generous slices of profits were handed out in dividends. These stocks appeared to reach their high point in the closing weeks of the year.

In 1952 General Motors stocks gained in value about $15.50 for each of the approximately 88 million shares of common stock. Market price saw extremes of 50 low and 67⅞ high. Dividends of $4 per share were paid during the year.

Chrysler shares increased in market value about $18.50 per share and $6 in dividends were declared for each share. Studebaker gained about $4.50 per share with $3 in dividends. Nash gained about $4 per share with a $2 dividend paid in 1952.

Willys stock also increased from 9½ to about 12½ on the market

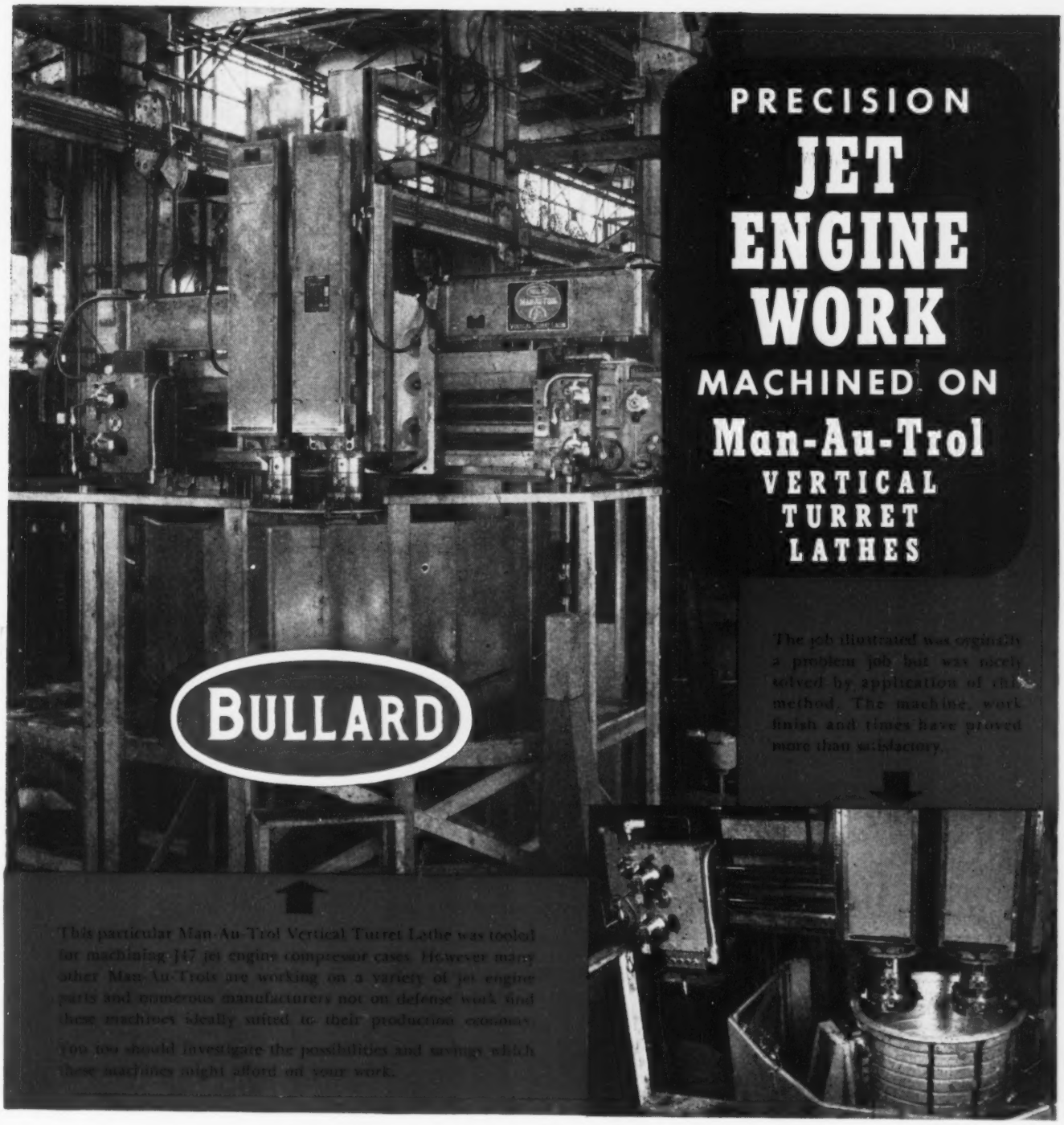
Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS	TOTAL
Dec. 20, 1952	105,470*	30,579*	136,049*
Dec. 13, 1952	91,806	29,739	121,545
Dec. 7, 1951	82,094	25,092	107,186
Dec. 1, 1951	88,115	27,512	115,627

*Estimated

Source: *Ward's Reports*



OPERATION DETAILS

ROUGHING

Rough bore I.D. with right ram.
Rough face and counterbore, turn O.D. with left ram.
Rough 5 large grooves with right ram.
Rough 7 small grooves with left ram.
Underface bottom and turn O.D. with right ram.

FINISHING

Finish bore I.D. with left ram.
Finish face and counterbore with right ram.
Finish 5 grooves with right ram.
Finish 7 grooves with left ram.
Finish underface bottom.

"Ask for Estimates on Your Work"

and Hudson jumped about four points to the current high of $17.25 per share. Hudson paid 75¢ in dividends. Packard started a climb under a new administration, inching up about $1 during the year. High was 5⅜.

Chrysler Reshuffles Engineers

A re-shuffling of engineering personnel which amounted to blanket promotions for 13 top engineers was completed at Chrysler last week. Seven new executive engineers stepped up from their chief engineer jobs and six assistants were made chief.

"The advancements have been brought about by the growth of our engineering activities and will provide a broader base of executive and administrative responsibilities in the major departments of our engineering division," declared James C. Zeder, vice-president and director of engineering and research.

In recent years competition among the auto companies for good engineers has rivaled competition for sales. Raids on one corporation by another have occurred frequently as they filled key spots in expanding engineering organizations.

Chrysler, for example, had increased engineering personnel from 2163 in 1945 to more than 3300 today while expanding floor space of operations from 540,000 to 675,000 sq. ft.

Sports Car Market Bids Planned

When Packard announced splitting production into two lines, one of its objectives was to tap the market for sleek sports cars.

From the intentions of all the makers of more plush cars, they appear to be convinced that a lucrative market exists for the low-slung custom convertibles.

Packard's offering is the Caribbean, a low, streamlined convertible that will hit the market with a $5200 price tag, plus taxes and transportation. The new car, patterned on the experimental Pan American, is only 62 in. high with a Continental styling and clean lines emphasized by a minimum of chrome trim.

Others also announced for the market are the Buick Skylark at about $5500 and the Cadillac El Dorado, at probably $1000 higher. Rumors are that one of the Ford divisions will also jump into the same market shortly.

Radical Styling Change Rumored

Because of its location in South Bend, Ind., Studebaker has not been exposed to the prying and snooping of automotive reporters as have the auto plants based in Detroit.

However, the rumors that have leaked out of this biggest independent's home indicate that something unusual is going on with the 1953 Studebaker.

The inside dope is that the current model change will be nearly as radical as that of 1946 when Studebaker astounded the automotive world with its sensational new styling of that year. Studebaker apparently feels the time is ripe for another shocker.

What few details there are indicate that the new car will be lower, more streamlined, and with even more glass in the top.

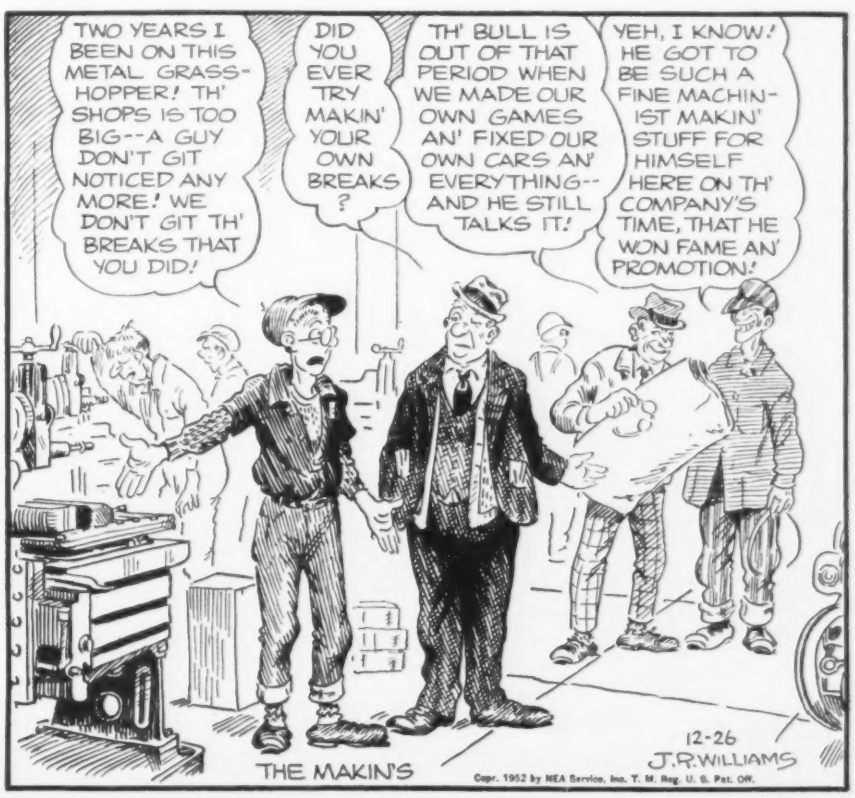
GM Will Revive Waldorf Exhibit

General Motors' lush extravaganza, known in the industry simply as "the Waldorf show" will be revived this winter. After 3 years of not staging the show because of emphasis on defense programs, GM officials have decided the time is ripe to bring back the production.

Visitors and native New Yorkers can view the spectacle, "GM Motorama of 1953" at the Waldorf-Astoria Hotel from Jan. 17 through Jan. 23.

Each division of GM will have large displays and full attention will be paid to GM's vast defense undertaking. Every automotive division will have special cars designed for the show to be featured with GM's experimental cars, LeSabre and XP-300. There will also be on display special research engineering and appliance exhibits.

THE BULL OF THE WOODS By J. R. Williams



...with new and improved
TEXACO MEROPA LUBRICANT

For years, steel men have looked on *Texaco Meropa Lubricant* as the ideal protection for their enclosed reduction gears. Now – because Texaco engineers keep their eyes constantly peeled for ways of improvement – you can count on it to give even better protection.

First of all, the EP characteristics of *Texaco Meropa Lubricant* have been stepped up – and the increased protection lasts longer, as proved by Timken Test and actual field service. The new and improved *Texaco Meropa Lubricant* does not separate in service, storage or centrifuging. Its high EP is not affected by high operating temperatures. Its exceptional adhesiveness is not affected by moisture.

In addition, the new and improved *Texaco Meropa Lubricant* has greater-than-ever resistance to oxidation. It does not thicken in service, does not foam, and is noncorrosive to bearings. There is a complete line of *Texaco Meropa Lubricants* to assure longer gear and bearing life, lower maintenance costs.

Let a Texaco Lubrication Engineer help you get greater efficiency and reduce maintenance costs throughout your mill. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO Meropa Lubricants
FOR STEEL MILL GEAR DRIVES

Faithfully yours
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Switch to Dual-Purpose Plants

New Administration will push peace-or-war plants . . . Guns or butter or both are the keynote in Wilson's plan . . . Tax cuts will come slowly, in orderly way—By G. H. Baker.

Government-guided plant expansion under President-elect Eisenhower's administration is to be charted on a fresh course. In essence, future emphasis will lie with development of dual-purpose (peace or war) industrial facilities.

They'll be tooled up to a certain extent for production of either civilian or military goods. Keynote is to be fast convertibility from peacetime products to the arms of defense.

Touchy Subject — This broad new pattern of basic production planning is a touchy subject to the outgoing mobilization planners. They're suspicious of it, say it doesn't permit them a sufficient degree of control.

But the nub of the idea, a special project of General Motors' C. E. Wilson (who is slated to be Secretary of Defense in Ike's Cabinet) is not new to scores of industrialists who have been urging its adoption by Washington.

Versatility—Essentially, it's industry's answer to the existing government plan of "stop-start" plant expansion. Up to now, Washington's demands for industrial expansion have always been geared more or less directly to the urgency —or the lack of it—of military requirements.

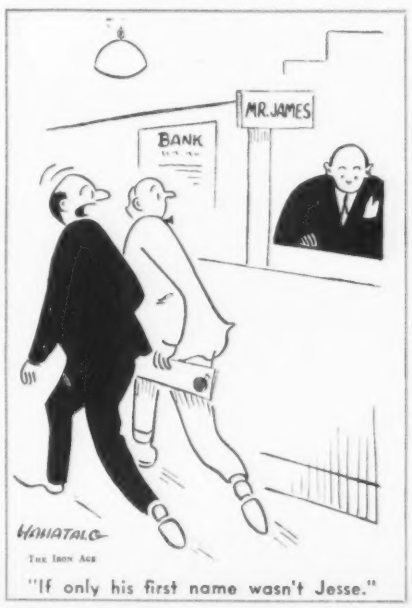
Under the Wilson plan, industrial facilities of the future are to be carefully cast in a dual role. Plants are to be designed so that they can turn out civilian or defense products, or both, in correct amounts to meet whatever international situation may exist.

As Mr. Wilson and other officials see it, this is the most economic and efficient solution to preparing for national defense.

Tax Cuts?—Prospects for widespread tax reduction, while brighter this year than at any time since the end of World War II, tend to become clouded when viewed in the light of long-range defense requirements and the resulting heavy demands for revenue upon the U. S. Treasury.

Large outlays for rearmament, to which the nation is already committed by President Truman's administration, are not to be cancelled at any early date by President-elect Eisenhower. Taxpayers, under "Ike," are to get more for their defense dollar, but any abrupt termination of military spending is definitely not in sight at this time.

Take It Easy—A lower rate of federal spending and lower tax rates will instead come about by degrees in order to minimize any possible economic dislocations.



"If only his first name wasn't Jesse."

Immediate problem facing the two tax-writing committees of Congress (Senate Finance Committee and House Ways & Means Committee) revolves around these three principal questions:

1. By what amounts may taxes safely be cut?
2. What kinds of taxes (income, excise, excess profits) are due for reductions or termination?
3. How soon may the cuts be ordered into effect?

Careful Pruning—"Ike" and his top aides take the position that the Federal Government must work toward "eventual" tax reduction through the avenue of careful and discriminate pruning of the federal budget. The first public indication of the new Administration's tax position probably will come in January.

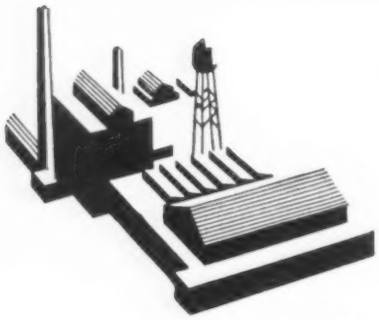
By that time, the new White House staff will have had a chance to study the budget prepared by Mr. Truman's staff to see whether or not they think any cuts in spending will permit tax reduction.

Expiration Dates—But even if "Ike" should decide against any tax reduction this year, some tax rates and schedules now in effect are due for automatic reduction.

The $3 billion-a-year excess profits tax on corporations will expire on June 30 unless extended by Congress;

Individual income taxes are scheduled for reduction as of Jan. 1, 1954, unless Congress decides otherwise. A reduction of about 11 pct for the majority of taxpayers will become effective. Loss to the Treasury: About $2.8 billion annually.

Income tax rates for corporations are to be reduced as of Apr. 1, 1954, at a loss of income to the Treasury of about $2 billion.



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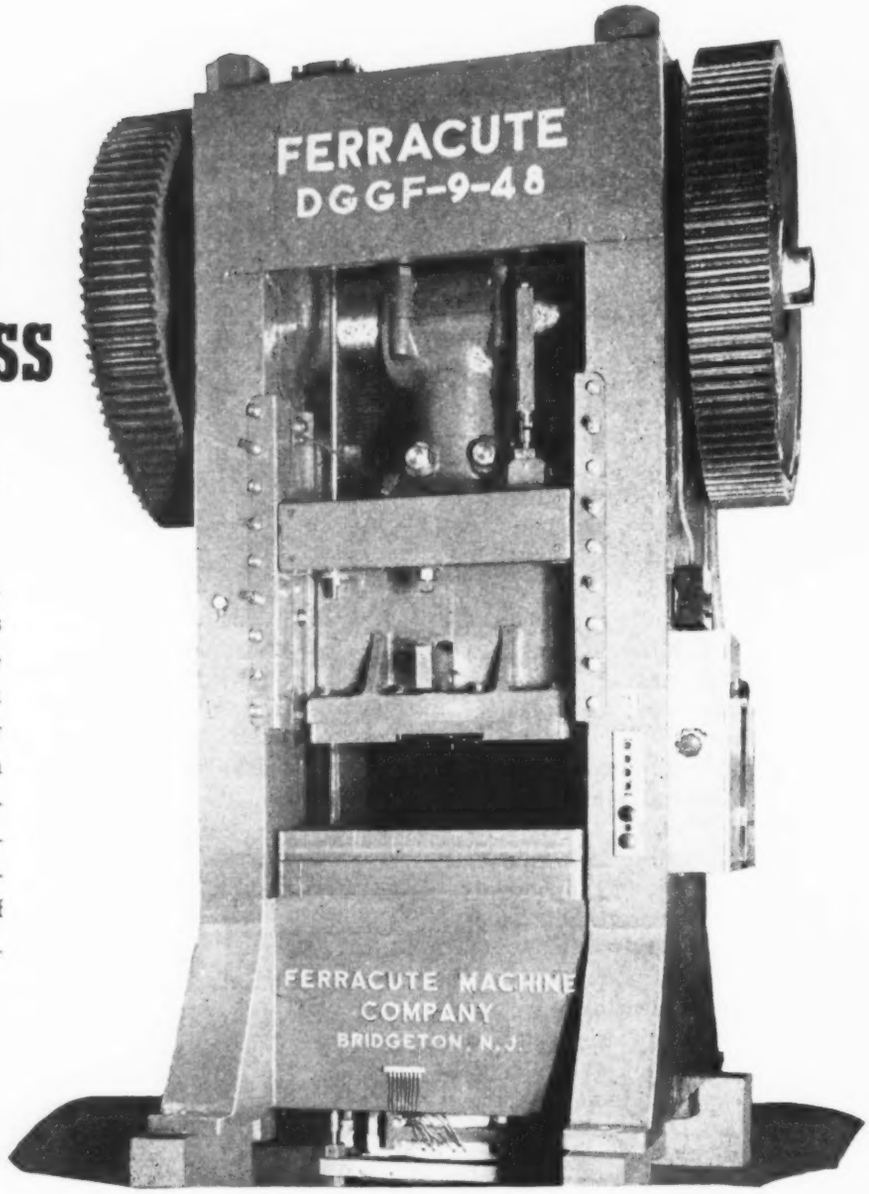

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CONTROLS: Hold Them for Ike

Controllers try to prevent collapse of programs, plan to give new administration an intact setup . . . Several to quit Jan. 20 . . . DiSalle will stay if asked—By *A. K. Rannells.*

Last week, advocates of continued controls over materials, prices, and wages were being rallied by the White House in last-ditch efforts to hold the crumbling program together ("status quo") long enough to hand it over intact to the new political administration.

Acceding to the wishes of President Truman, Henry H. (Joe) Fowler took back his resignation as Director of Mobilization, previously effective Dec. 31, and agreed to stay on until at least Jan. 20, the inaugural date.

In the first of a series of related actions, Michael V. (Mike) DiSalle was called back to Washington as the strong man to shore up and prevent a falling apart of the price and wage program. He replaced Economic Stabilizer Roger Putnam, who quit following a booting around during the coal wage decision.

Now a "Committee" — To help Mr. DiSalle "hold the line," Charles C. Killingsworth was elevated from mere membership to the job of chairman of "what is left of the wage board" which is to be known as the Wage Stabilization Committee.

Also, Joseph H. Freehill was raised from the ranks to become director of the Office of Price Stabilization. He takes a dim view of holding down prices without OPS, declaring that at least 35 industries want price increase surveys which could mean hikes ranging from 5 to 20 pct.

Add a Billion—Each 4 pct increase in durable goods prices, he estimated, would add $1 billion to the defense budget.

All will submit resignations effective Jan. 20. Unlike the others, however, Mr. DiSalle did not rule out staying on with the Eisenhower administration if asked.

"I believe price and wage controls should be continued or I wouldn't have come back," Mr. DiSalle says. "How necessary they might be after Jan. 20 depends upon domestic and international decisions by the new administration."

He refuses to believe that the coal-wage decision forecasts a collapse of the stabilization program. He pointed out that an earlier decision to permit the steel industry to boost prices more than the government thought necessary had not brought such dire consequences.

Only a Twist — Insofar as the walkout of members of the wage board is concerned, he likened this to the walkout of labor members in the earlier days of the board. Industry criticized labor then, he said, but now the shoe is on the other foot.

He still believes that the board can be pulled back together if the new administration decides to carry on, and that the tripartite approach is the only one.

Follansbee Seeks RFC Loan

Expansion plans at Follansbee Steel Corp., Pittsburgh, will be greatly strengthened if Reconstruction Finance Corp. honors the company's request for a $29.5 million loan.

A month or two may pass before RFC decides whether to grant the loan, which would be used to build a melt shop, blooming mill, and five-stand hot-strip mill, and install other equipment at Follansbee, W. Va.

Equity financing amounting to about $4.5 million also would be a part of the program, designed to make Follansbee a semi-integrated producer of specialty steels.

Follansbee has obtained a certificate of necessity permitting fast tax write-off for about 70 pct of the total projected expansion, expected to cost about $34 million.

"May I retract my safety suggestion? It didn't work."

SELENIUM:

Still short but output is rising . . . Stockpiling a big question.

Production of selenium is gradually rising toward adequacy of meeting requirements although users, such as makers of selenium stack rectifiers are generally on a hand-to-mouth basis.

Doubt has been recently expressed by industry as to whether supplies can be materially increased by construction of additional production facilities. Defense Production Administration recently established a goal of 1,100,000 lb-capacity by 1955, an increase of 250,000 lb over 1950.

Tax certificates will be issued for construction of such facilities. But industry leans to the belief that the answer to shortages lies in improvement of metallurgical processes for recovering the selenium from copper rather than by expansion.

Stockpile a Question — Meanwhile, the government is pondering whether to stockpile high purity selenium, and in what amounts. At present, it is claimed by industry, this would result in severe shortages.

If stockpiling is put into effect, industry warns, the government must be prepared to adopt a rotation plan. Stockpiled selenium should be placed on the open market and replaced with new every 12 months, industry said.

West a Prime Tinplate Market

Farmers still outrace the steelmakers . . . Area's tinplate output is 262,000 tons a year short of use . . . Steel shortage slowing tinplate production—By T. M. Rohan.

The fertile valleys of the West are still growing fruits and vegetables faster than western steel can turn out tin cans for them. Despite major gains in tinplate capacity during 1952 and scheduled for 1953, the farmers still outdistance the steel men.

The seven western states produce 47 pct of all fruit in the U. S. in dollar value. In addition, California, Washington and Oregon produce 30 pct of the vegetables. Although the seven western states produce only about 7 pct of the nation's steel, they use 15 pct of its tinplate.

Still Shy—By mid 1953 the two western tinplate producers, U. S. Steel Columbia-Geneva Div. and Kaiser Steel Corp., will have a combined capacity of about 614,000 annual tons of tinplate—still short by 262,000 tons of the 876,000-ton consumption. The deficit is, of course, shipped in from the East.

With the start-up of high speed, high efficiency mills such as Fairless Works, an increase in cheap water transit of tinplate to the West is probable. Eastern producers have privately confided that with new mills and cheap water freight they hope to deliver in California for less than the locally produced product.

Capacity Growth — The years 1952 and 1953, however, represent a major stride in closing the gap between Western tinplate production and consumption. Although made as early as 1929 by the old hot dip mill of Columbia Steel Co. at Pittsburg, Calif., the first major production began there in 1948. In that year, U. S. Steel opened its 468,000-ton 5-stand cold reduction mill with its accompanying hot dip and electrolytic lines, succeeding the old hot dip plant shut down in 1942 to save tin.

Practically a duplicate 4-stand mill has been erected alongside. This will have a continuous pickler, 54-in., 4-stand cold reduction mill, electrolytic cleaning line, electrolytic tinning line, 4-coil annealing furnaces, side trim and recoil line and galvanizer. This will take the sheet load off the existing 5-stand mill.

Plant capacity will be about 252,000 tons electrolytic and 162,000 tons hot dip or 414,000 tons. Parts of the mill are in operation but full production will probably not start until about March, 1953.

Need Steel—Whether the new capacity can be fully utilized at this time is problematic, however, because of the obvious shortage of steel from Geneva, Utah, Works. All products produced at that plant, plates, hot-rolled sheets in coils, structurals and coils, for the Pittsburg mill are in extremely short supply and are expected to remain so well into 1953.

Nice of the company to set up this bar.

The Western tinplate race had a new entry in December when Kaiser dedicated its $20 million Fontana tinplate mill. Kaiser had considerable good luck breaking in the mill and got out 412 tons to help the fruit canning crisis early in August following the steel strike. Kaiser so far has delivered to American, Continental and Pacific Can in token quantities and 80 pct of forecasted 1953 tonnage has been taken by western can makers. Full rated production of 16,700 tons monthly is expected by mid-year.

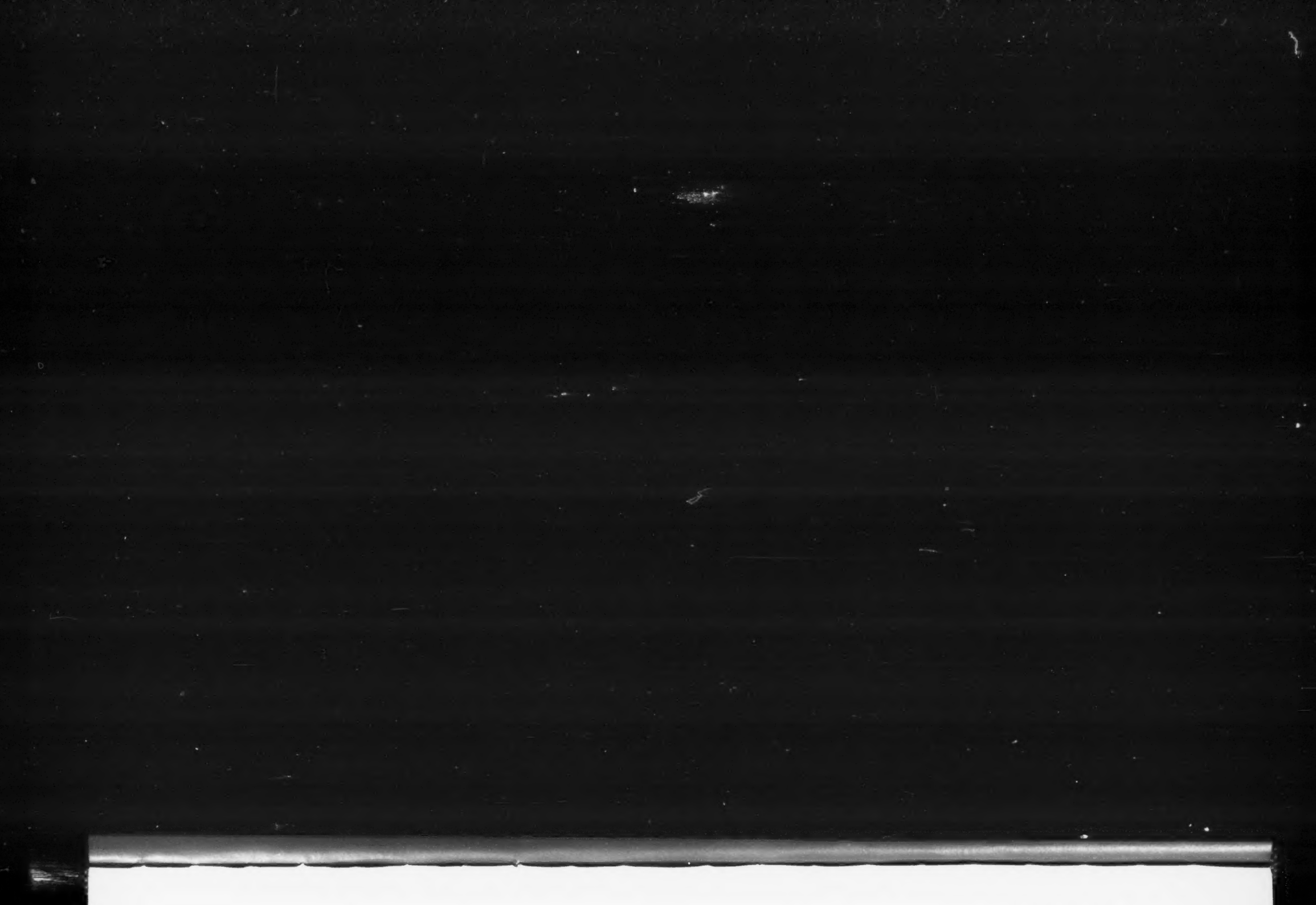
Fast Mill—The new Kaiser mill is a United 5-stand tandem cold reduction mill with 4000 fpm delivery speed, second only to Weirton's mill. The tension reel can also be interchanged for rolling sheet stock.

American and Continental Can in that order dominate the western picture but the independent Pacific Can Co. of San Francisco is making headway.

The western tinplate future is undoubtedly bright. Some can company executives expect to double their output in 10 years. With even turkeys, french fried potatoes, pork and beans and, of course, beer by the millions of barrels going into cans, the future of the West as a tinplate market looks assured.

Extend Pipeline — Interprovincial Pipe Line Co., currently piping oil from Alberta to Superior, Wis., now plans to extend the pipeline into Sarnia, Ontario. If built, the line extension will be 625 miles in length.

The route of the extension would be across Northern Wisconsin and Michigan to the Mackinac Straits, then south through Michigan to the St. Clair River.



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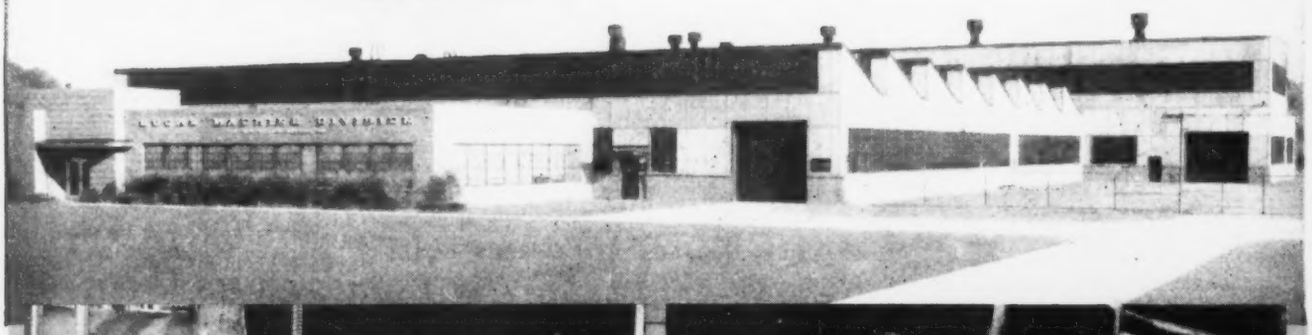

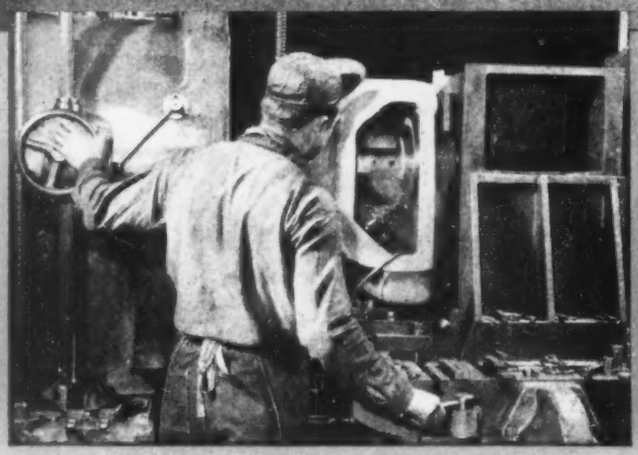

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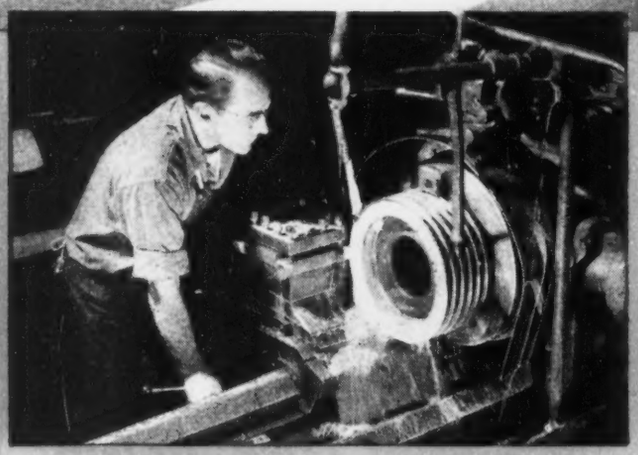

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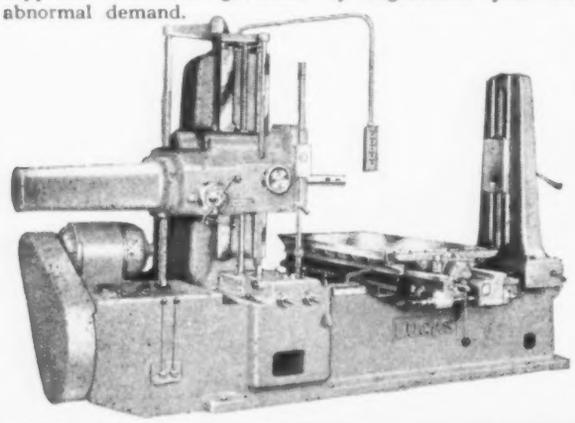

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Welcome Mat Out for 'Elephant' Tools

DPA beckons to machine tool makers to expand plants to make giant tools needed for heavy press, other programs . . . Need about 450 . . . Industry not rushing in—*By E. C. Beaudet.*

Defense Production Administration is waiting with open arms for applications of machine tool makers to build new production facilities for turning out the "elephant" machine tools needed to support the government's heavy press and other programs.

These super-size, multi-purpose precision tools weigh from 250,000 to 450,000 lb when completed. About 450 are needed as soon as possible under present requirements, according to DPA.

When built, they will be used mostly in building the heavy presses needed to make complete wings for the jet planes, specific items for the atomic energy program and for large ship components (propellers, turbines).

Above the Goal—Construction of these facilities will be over and above the recently announced expansion program for machine tools. This called for an additional investment by industry of $131 million in new capital equipment.

The government is somewhat vague concerning the extent of specific capacity needed for the bigger tools. However, it is learned that DPA is talking of $50 million as a starter.

Logical Reluctance—But industry is not rushing in to take part in this specialized expansion. There is a feeling among some in this segment of the machine tool industry that present capacities are sufficient to take care of all normal civilian business and that any further expansion would be detrimental. It is claimed by some government sources that present capacity is insufficient to support present and future government programs of this kind.

Builders are hesitant to take part in expansion which may become idle during normal civilian demand or if government programs are cancelled or cut back.

Test Phase?—So far only two machine tool builders have filed applications to participate and become eligible for tax certificates and other help. Some say these are being used as test cases to determine how the program will work out. After these have been processed other builders of this equipment may come in or be asked to take part.

Demand for machine tools for the heavy press program is expected to be first centered on those tools needed to machine the die blocks going into the presses. Equipment to machine the large forgings themselves may get second priority.

Tooling for NATO — Off-shore procurement of military end items for the NATO forces by the Defense Dept. will require some additional tooling for production. Up to $1 billion worth of military end items will be contracted for with European manufacturers next year.

"Fifteen years without a raise. If my position wasn't so important, I'd quit."

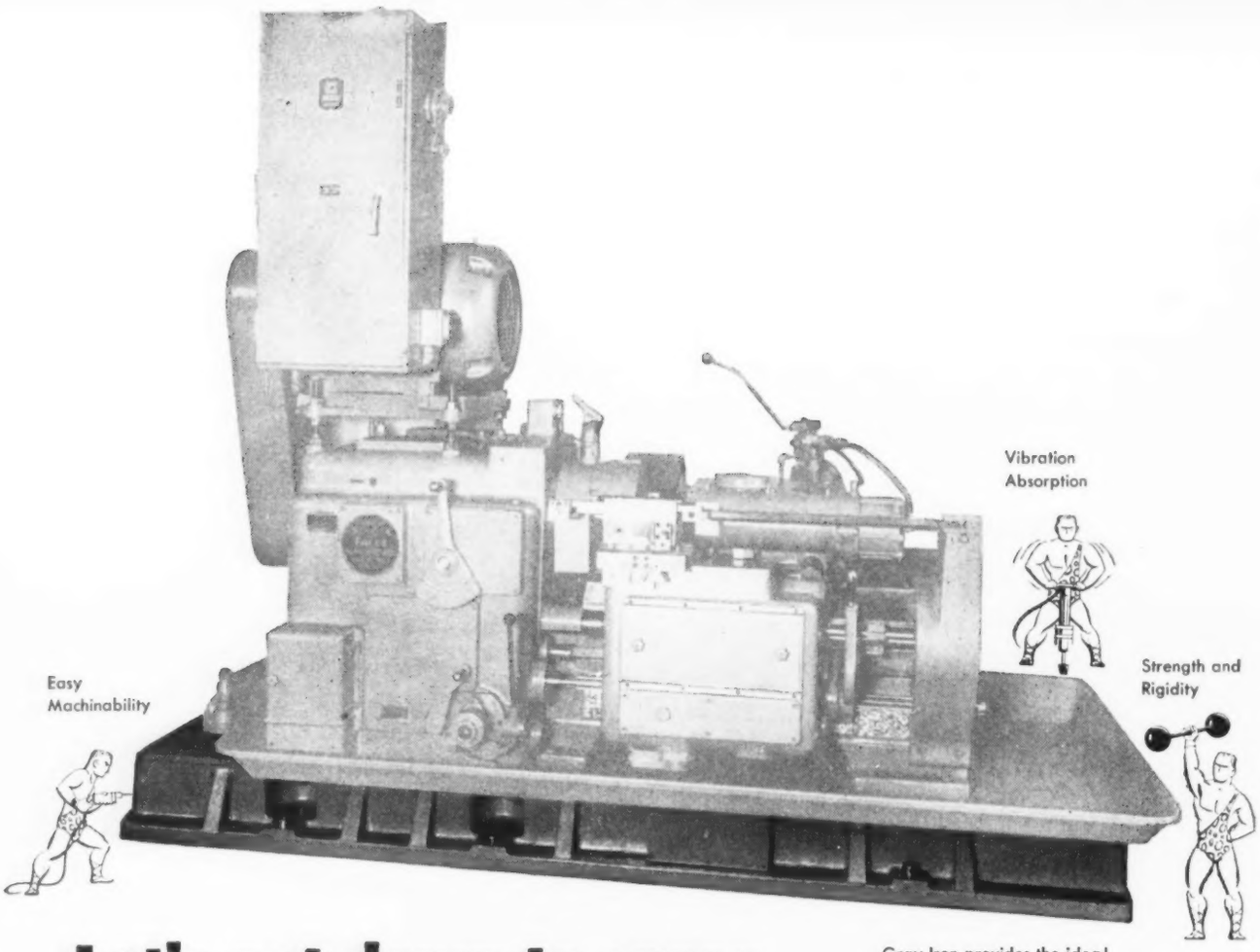
Many plants participating in this demand have already been tooled. Some additional U. S. buying may result from the $80 to $90 million worth of aircraft orders going to the Netherlands, France, Italy and Belgium under United Kingdom licenses.

Orders for ammunition will total about $300 million, but little is expected to be spent for machine tools because of lines already set up and the smaller percentage of pre-production costs involved.

British Cancellations — Shipments of machine tools for the United Kingdom defense effort will range from $70 to $80 million at the end of 1952. The British are trying to cancel several hundred machine tools due to a stretch-out of their defense program. Britain originally contracted for about $120 million worth of American machine tools after the Korean War. Uncancelled orders will be completed by the second or third quarter of 1953.

So far, France has cancelled a negligible amount of defense machine tools ordered after Korea. Cancellations have been more in the nature of replacements and refinements of their defense program. Shipments to the Netherlands and Norway have been for the most part all delivered.

NMTBA Report—A report entitled "Standards for Training Machine Tool Draftsmen" has just been published by the National Machine Tool Builders Assn. The report includes a summary of standards for training machine tool draftsmen, and suggested apprenticeship applications.



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Free Use of Steel in Canada

Steel end-use restrictions to end with the year . . . Expect building boom for non-essential structures . . . Inventory limits also dropped . . . Steel capacity higher—*By F. Sanderson.*

Canada is abandoning controls and restrictions on use of steel. This should bring a sharp uplift to areas of manufacturing and building which were not permissible while steel was under wraps.

The ban on steel for non-essential buildings will be lifted on the first of the New Year, meaning that anyone wanting to build theatres, bowling alleys, taverns, certain types of plants, stores and similar structures will be permitted to buy steel—if he can.

The government retains only one control—assuring that defense industries will get all the steel they require.

Inventory limitations will be rescinded at the same time. Whether an applicant got all, part or none of the steel he wanted was determined largely by what stock he had on hand—even if he had a permit.

Better Supply—Lifting of controls was announced in the House of Commons by John Dickey, parliamentary assistant to Defence Production Minister Howe. He said the prospect of improved supplies of steel justifies revoking the prohibition on non-essential building.

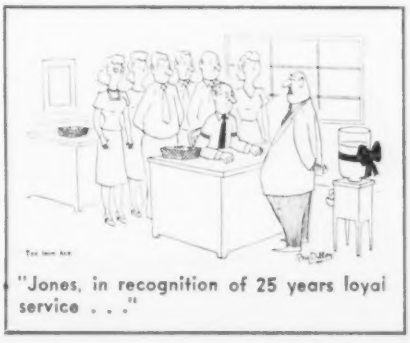
Mr. Dickey further said that it will still be necessary to exercise control over steel distribution to insure that defense requirements are met. If a plant making guns or other war materials needs steel, the Dept. of Defence Production will still be able to direct a producer to supply it.

Mr. Dickey added that continued improvement in the supply of steel could be expected but some types and forms of steel likely will be relatively tight for some time. Relaxing of steel controls with the recent removal of the deferred depreciation regulations probably will result in a sharp increase in non-defense building.

Capacity Boost — The Canadian steel industry is producing at steadily higher levels. As a result of new steel mill installations, completed within the past month, Canada's productive capacity has been upped by almost 1 million tons annually. A new finishing mill went into production at the Algoma Steel Corp., Sault Ste. Marie, last month, boosting capacity for rolled steel products by 250,000 tons a year.

New openhearth furnaces just placed in operation by the Steel Co. of Canada Ltd., Hamilton, increased ingot capacity there by 650,000 tons a year, while a new blast furnace blown in by the company jumped pig iron capacity about 500,000 tons a year.

Imports—It is expected that imports of steel from the United States, the United Kingdom and elsewhere could continue at about the 1952 level if required. Imports from Continental Europe may be sharply cut if shippers continue to demand premium prices. Many orders for second and third quarter delivery from European mills are being held in abeyance pending further information regarding the future supply situation from Canadian and U. S. mills.



"Jones, in recognition of 25 years loyal service . . ."

Copper Treatment — Sherritt-Gordon Mines, Ltd., is arranging for Noranda Mines, Ltd., to treat copper concentrate from the Lynn Lake, Manitoba, operation until such time as Sherritt's refinery at Fort Saskatchewan has treatment capacity available.

Previously Sherritt-Gordon was assured that Hudson Bay Mining & Smelting Co. would treat its copper concentrate, but word has just been received from the latter that it is no longer in a position to do so.

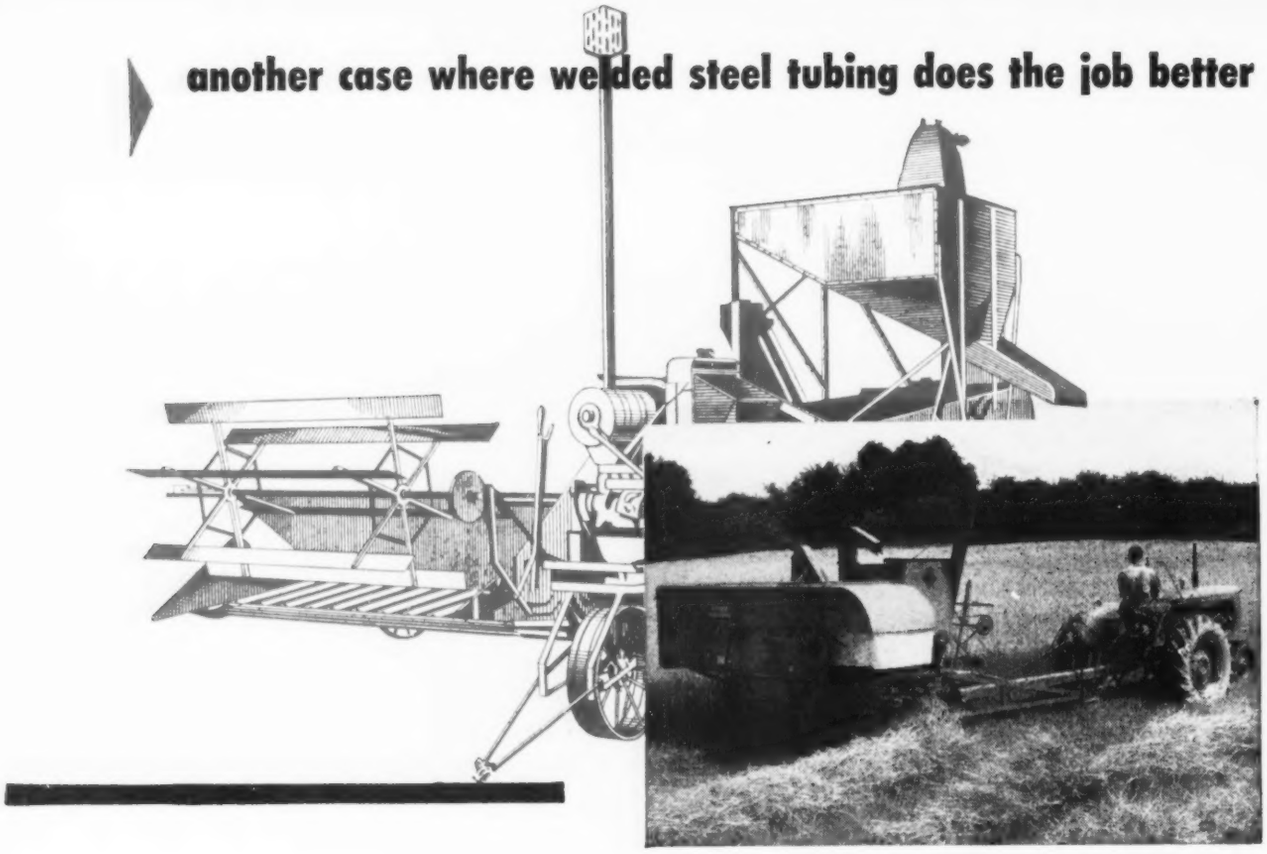
Construction work at Lynn Lake is well up to schedule and installation of machinery can be carried out during the winter months. Erection of permanent mining plants at the "A" and "EL" mines has been completed and both are in operation with the exception of the big hoists at the "A" mine.

Good Year — Railroad rolling stock builders, including makers of diesel locomotives, passenger and freight cars, have completed one of the best years in their history.

As a result of the big rolling stock orders placed by railway companies in Canada, rolling stock builders will enter the New Year with a backlog of unfilled orders sufficient to maintain virtual capacity operations throughout 1953. In addition a good volume of export business is reported.

Replacement—As a result of delayed rolling stock replacements during the war and the years immediately following, much of the equipment is both out-of-date and wornout. Canadian railway companies now are seriously engaged in replacement programs which involved expenditure of upwards of $750 million.

another case where welded steel tubing does the job better



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Magnet reels

McCaffrey-Ruddock Tagline Corp. recently completed a new 16-p. bulletin on the installation, operation and care of its Rud-O-Matic Magnet Reel and Tagline. The publication describes methods by which users of traveling or overhead cranes can step-up efficiency of all magnet operations in steel plants, foundries, scrap yards and other industries. Additional data is presented on the standard Rud-O-Matic Tagline for use with clamshell buckets. *McCaffrey-Ruddock Tagline Corp.*

For free copy circle No. 1 on postcard.

Forging presses

Clearing forging presses are said to produce forgings at relatively high speed and with utmost accuracy. Comparatively little skill and manual effort are required from the operator to operate these presses. Use of forging presses is claimed to increase die life since the dies are not subject to punishing hammer blows. More information is contained in a new folder. *Clearing Machine Corp.*

For free copy circle No. 2 on postcard.

Rubber coating

Magic-Vulc is a tough plastic rubber coating used to line, resurface and protect all types of industrial equipment from corrosion and abrasion. Detailed instructions concerning its use are available in a new, revised catalog which helps potential users judge for themselves whether Magic-Vulc can be applied to their own equipment. One particularly interesting application described in detail is the use of Magic-Vulc to coat and repair worn conveyer belts. *Magic Chemical Co.*

For free copy circle No. 3 on postcard.

Induction heating

Available from Westinghouse is a brochure describing its induction heating work-handling machines. Units pictured and described are: Horizontal scanners, vertical scanners, gear-hardening machines and generators. Case histories of time and money savings achieved from use of Westinghouse induction heating equipment are included. *Westinghouse Electric Corp.*

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Disc clutches

Carlyle Johnson Machine Co.'s 1953 catalog contains information, photos and diagrams of the eight sizes of standard Maxitorq floating disc clutches, available in capacities of ¼ to 15 hp at 100 rpm. Also covered are automatic overload release clutches and pulley type, cut-off coupling and ring-type driving cups. *Carlyle Johnson Machine Co.*

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Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **12/25/52**

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16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
46	47	48	49	50	51	52	53	54	55	56	57	58	59	60

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Free Publications

Continued

Fire extinguishers

Red-Flo is a nitrogen-pressurized dry chemical fire extinguisher reported to insure free, non-clogging dry chemical discharge. Outlined in a new circular, the publicaion contains details on construction and performance of the 3, 5, 10 and 20-lb Redi-Flo units. Also described is Dri-Kem, a dry chemical extinguishant developed for use in the company's extinguishers but which is also offered separately. *Stop-Fire Inc.*

For free copy circle No. 6 on postcard.

Steel

A price book covering Ryerson steels is now available. All types of Ryerson steel are covered and detailed information on specifications is included. The book has a convenient tab index. *Joseph T. Ryerson & Son, Inc.*

For free copy circle No. 7 on postcard.

Drill stops

Drill stops, designed to provide positive control of hole depth, are described and illustrated in a new 4-p. bulletin prepared by Scully-Jones & Co. Standard and special drill stops are covered and a price listing on these items is included. *Scully-Jones & Co.*

For free copy circle No. 8 on postcard.

Salt baths

American Cyanamid Co. has published a new booklet dealing with heat-treating problems. Through a series of case histories the booklet explains how several manufacturers used Cyanamid processing chemicals to overcome such problems as scale distortion, non-uniform case composition, insufficient hardening, sludging, short pot life and incomplete washing. *American Cyanamid Co.*

For free copy circle No. 9 on postcard.

Inspirators

Where high pressure gas from 1 to 30 lb is available, Hauck High Pressure Gas-Air Inspirators make it possible to use the energy of the gas to inspirate the air needed for combustion. Among the advantages of these units which are outlined in a new leaflet are: Maximum air entrainment, elimination of blowers and compressors for combustion air, and automatically maintained gas-air ratio. *Hauck Mfg. Co.*

For free copy circle No. 10 on postcard.

Ac to dc

General Electric's Tungar Bulbs used for changing ac power to dc are covered in detail in a new technical bulletin. A convenient addition to the specification table in the bulletin is a listing of typical applications for each type of bulb described. *General Electric Co.*

For free copy circle No. 11 on postcard.

Metals

Rigid-Tex is a metal with a raised design surface said to be stronger than flat-rolled metal but without extra weight. It permits use of lighter gages and its attractive surface designs make it ideal for applications where appearance as well as strength is important. Described in complete detail in a new brochure Rigid-Tex is available in ferrous or non-ferrous metal in sheet, strip, coil or cut length. *Rigidized Metals Corp.*

For free copy circle No. 12 on postcard.

Purifiers

New literature on the V. D. Anderson Co.'s line-type Hi-eF Purifiers explains how these mechanical separators can save money for most plants by removing 99 pct of the dirt, solids, moisture and other matter from steam, vapor, compressed air and gases. Typical uses for these separators are: To keep moisture out of paint spray equipment, air tools, chucks and other pneumatic equipment; to protect all types of steam drums and steam ejectors by cleaning up steam; and to remove water and oil from gas lines. *V. D. Anderson Co.*

For free copy circle No. 13 on postcard.

Turn Page

use postcard below

Postcard valid for 8 weeks only. Information may be secured subsequently by separate letters fully describing each item wanted, including company name.

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **12/25/52**

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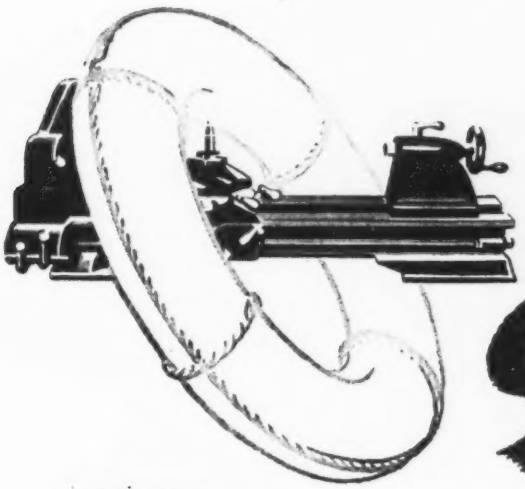
FIRST CLASS
PERMIT No. 36
(Sec. 34.9 P.L.&R.)
New York, N. Y.

BUSINESS REPLY CARD

No postage necessary if mailed in the United States

POSTAGE WILL BE PAID BY

THE IRON AGE
Post Office Box 77
Village Station
NEW YORK 14, N. Y.



LIFE SAVING!

QUICK ••• economical replacement of worn bearings in machine tools and industrial machinery with Bunting Standard Stock Bearings in 854 sizes.

EASY ••• installation of new bronze bearings in electric motors with Bunting Electric Motor Bearings in 324 sizes.

FAST ••• economical production of special bronze bearings and parts with Bunting Precision Bronze Tubular and Solid Bars in 263 sizes.

Bunting Ads win 1st award in contest sponsored by Industrial Distributors Associations.

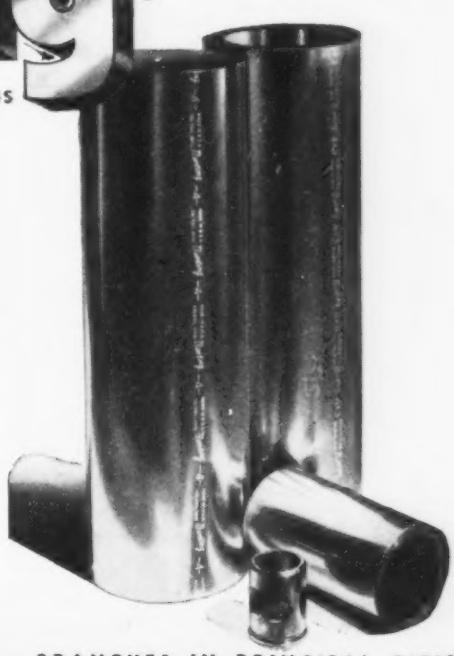
Life of production equipment and machinery is prolonged, and down time avoided by the ease and speed with which Bunting Standard Stock Bearings, Electric Motor Bearings and Precision Bronze Bars can be obtained and employed.

Bunting®

BRONZE BEARINGS • PRECISION BRONZE BARS • BUSHINGS

...IN STOCK EVERYWHERE

Bunting products are instantly available in all markets, from the stocks of leading industrial distributors and distributors of specialized industrial items. Ask your distributor or write for catalog.



THE BUNTING BRASS & BRONZE COMPANY • TOLEDO 1, OHIO • BRANCHES IN PRINCIPAL CITIES

—Free Publications—

Continued

Lubrication

Lubricants for internal combustion engines and for lathe center and steady rest lubrication are described in two new circulars put out by Alpha Corp. Molykote Type A lubricant for internal combustion engines is said to be effective over temperatures ranging from 0 to 750°F. Molykote-Centerlube in addition to its application for lathe operations is equally suited for such tough jobs as lubricating press fittings, heavily loaded gears, ways of machine tools and for reducing wear on thread and plug gages. *Alpha Corp.*

For free copy circle No. 14 on postcard, p. 49.

Universal joints

Apex Machine & Tool Co. has just issued a new 24-p. catalog describing its complete line of universal joints for aircraft and industrial applications. Featured in the catalog are several order application data sheets. These sheets provide a simple, concise means of indicating specific universal joint requirements to insure a quick and thorough analysis of specialized applications. *Apex Machine & Tool Co.*

For free copy circle No. 15 on postcard, p. 49.

Recorders, indicators

Catalog 1520 contains factual information concerning Electronik non-control precision instruments which employ a potentiometer, Wheatstone bridge and other measuring circuits to measure temperature, pressure, flow, pH and other variables. Detailed specifications for different models are contained in a new handbook. *Minneapolis-Honeywell Regulator Co.*

For free copy circle No. 16 on postcard, p. 49.

Measuring equipment

In a new catalog, Profilometer equipment for shop measurement of surface roughness is detailed. Shown and described in the publications are amplimeter equipment, tracers, manual and motor-driven piloting equipment and other units. In addition, combinations of Profilometer units most commonly selected from various job requirements are discussed. *Micrometrical Mfg. Co.*

For free copy circle No. 17 on postcard, p. 49.

How would you solve it?

Production Problem:

Grind and finish shotgun barrels in one high-speed operation

1 Winchester Repeating Arms Co., New Haven, Conn., turned this grinding and finishing problem over to a 3M Methods Engineer who used his wide knowledge of coated abrasive applications, and came up with a solution.

2 His answer to this problem was a conversion to backstand equipment with fast-cutting abrasive belts. A backstand idler was also recommended—plus the correct abrasive belt, proper grit size and most efficient operating speed.

3 Now Winchester uses the 3M Method to rough grind and finish shotgun barrels more than twice as fast as with their previous method of using set-up wheels—with smoother finishes, too!

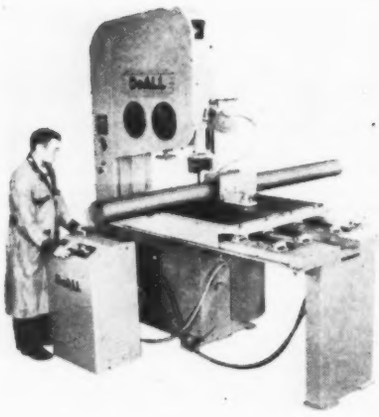
4 3M Methods Engineers, in demonstration rooms throughout the country, are ready to help *you* cut grinding and finishing costs. For more information and a copy of "Step Up Production," write: 3M, Dept. IA122, St. Paul 6, Minnesota.

FIFTIETH ANNIVERSARY
3M
ABRASIVES
1902 ★ 1952

Made in U.S.A. by **MINNESOTA MINING & MFG. CO.**, St. Paul 6, Minn. —also makers of "Scotch" Brand Pressure-sensitive Tapes, "Scotch" Sound Recording Tape, "Underseal" Rubberized Coating, "Scotchlite" Reflective Sheeting, "Safety-Walk" Non-slip Surfacing, "3M" Adhesives. In Canada: London, Ont., Can. Export: 122 E. 42nd St., New York City.

NEW EQUIPMENT

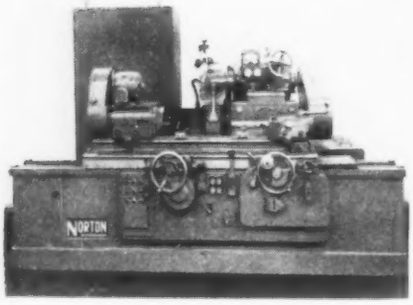
New and improved production ideas, equipment, services and methods described here offer production economies . . . just fill in and mail the postcard on page 49 or 50.



Band machine handles heavy duty cutoff work

A large capacity band sawing machine with wide speed range is designed for rapid, heavy duty cutoff work. It handles ferrous or nonferrous metals and all shapes including plate, structural, ingot, slab, pipe, extruded or rolled forms. The saw blade is twisted 90° from conventional position at the worktable so that the work is fed to the blade from the front of the machine. Length of stock that can be cut is not limited by the throat capacity. However, the Model CO-36 can be converted to conventional high or low speed, straight or contour sawing. It handles 15½ in. work thickness under the saw guides and 9½ in. thickness at the column. Work table 40x48 in. is hydraulically powered and capable of handling work up to 2000 lb in weight. *DoAll Co.*

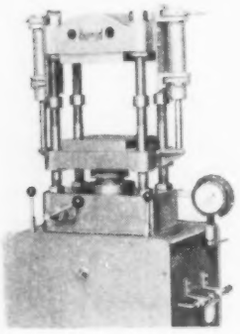
For more data circle No. 18 on postcard, p. 49.



Machines perform plunge-cut, traverse grinding

New heavy-duty plain or semiautomatic cylindrical grinding machines, made in 18, 36, 48, or 72-in. work lengths, rapidly and accurately perform plunge-cut and traverse grinding operations that require larger diameter or wider grinding wheels than are accommodated by conventional cylindrical grinders. Fast grinding action with enduring precision is assured. This is due to the heavy wheel head with super-duty size pressure-lubricated wheel spindle for 10-in. wide wheels, the rigid work-supporting units and the smoothly operating sliding components. *Norton Co.*

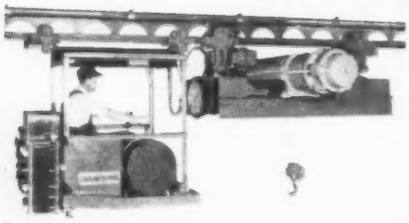
For more data circle No. 19 on postcard, p. 49.



Molding presses powered from shop air line

Hydrolairs are small, lightweight, plastic molding presses which take their power entirely from the shop air line. The press illustrated has a 30-ton capacity and is equipped with air-operated pushback cylinders for powered ram return. Hydrolairs are said to reduce production costs. They are fast and full power-operated, with high pressure stroke yet without usual motors and pumps. Selected pressure is automatically applied and maintained, even on compressible materials. Hydrolairs can be modified to meet a wide range of specific production requirements. *Elmes Engineering Div., American Steel Foundries.*

For more data circle No. 20 on postcard, p. 49.



Tramrail carrier weighs all loads handled

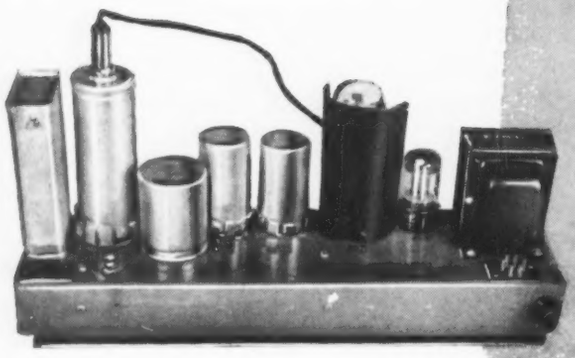
An overhead traveling carrier equipped with a hydraulic cell scale permits weighing all loads handled, quickly and easily. The scale weighs in pounds or kilograms, as desired. The motor-driven tramrail carrier has a travel speed of 300 fpm. Hoist has 38-fpm speed and a lift of 36 ft. Both travel and hoisting motors are provided with variable-speed controllers. Load capacity is 3 tons. *Cleveland Tramrail Div., Cleveland Crane & Engineering Co.*

For more data circle No. 21 on postcard, p. 49.

United Engineering and Foundry Company

PITTSBURGH, PENNSYLVANIA

A lot of Engineering for an Amplifier, but...



Good engineering shows in this Amplifier's wide range of sensitivities, and of impedances, thorough filtering and plug-in connection to the rest of the Speedomax instrument.

Good engineering shows in this Converter's phenomenally low noise level and in its long-lived performance.

Good engineering shows in this Slidewire's non-inductive winding and in absence of any flexible leads which might form inductive loops.

Good engineering shows in this balancing motor's small size, and in its torque ample to operate accessory control and signalling fitments.

it helps Speedomax to fit your ideas!

• Your needs and ideas put this electronic "tool" to work on an amazing variety of jobs. Controlling furnaces and peering into atoms; counting bottles and spying on the weather; taking the "shine" out of rayon or putting it on hardware, to name six out of thousands of uses. For, in general, if you can feed Speedomax a tiny electrical signal, representing the condition you wish to measure, the instrument will not only put "calipers" on it, but will amplify it enormously to direct anything that can be directed through electrical or pneumatic means.

The Speedomax way of handling this job provides particularly accurate results and an especially good fit in meeting your individual ideas. For instance, there's the matter of receiving the signal in a way suited to its size—or, more usually, to its smallness.

We have no less than twenty-three carefully-engineered Speedomax Amplifiers covering a wide range of sensitivity and impedance levels. One Amplifier in the series enables the Speedomax to respond to a signal of only 10-16 watt—one ten-billionth of a microwatt. No other recorder amplifier comes within 3 magnitudes of this figure. Such sensitivity means corresponding accuracy in detecting the tiny unbalance—called "error" by circuit engineers—which actuates the rebalance system.

In terms of power, all 23 Amplifiers deliver the same—5 or 6 watts. This is from 2 to 4 times the output of other recorder amplifiers; permits a more powerful balancing motor. And the Amplifier-Motor team provides an especially high torque gradient just where it's needed—centering around the balance point—for prompt, positive balancing and easy, effortless operation of a "heavy" load of control or signal devices in the motor shaft.

The Speedomax story for industry is told in Catalog ND46(1); for Research, in Tech. Pub. ND46(1). We will send either on request; address our nearest office or 4956 Stenton Ave., Phila. 44, Pa.

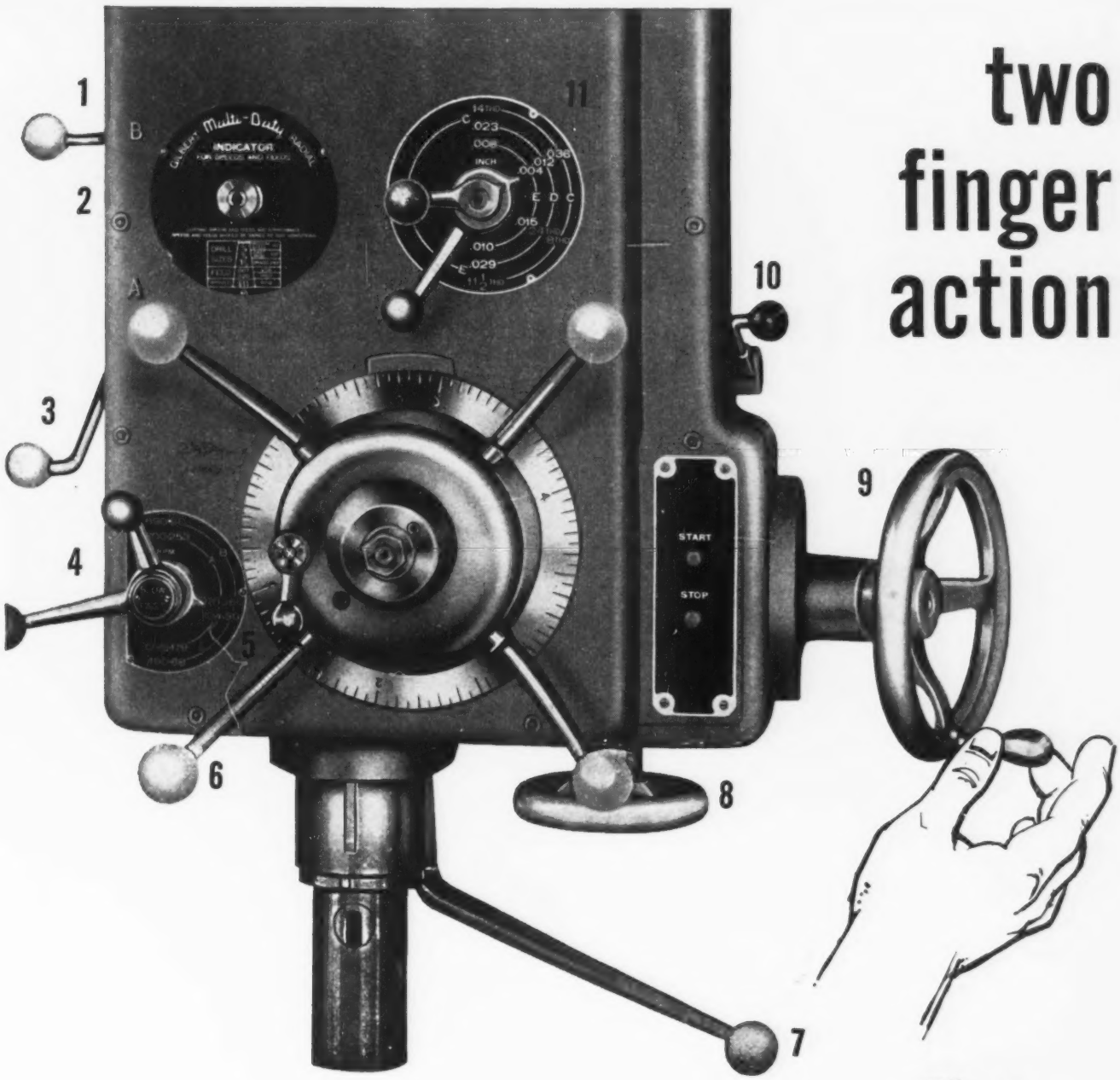
LEEDS instruments **NORTHRUP** automatic controls • furnaces

Jrl. Ad. ND46(G)

CAREER OPPORTUNITIES AT L&N

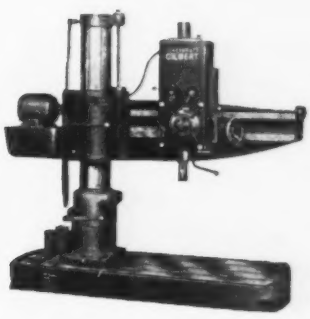
Expansion program of this long-established firm has many features to attract outstanding recent graduates in engineering and science. Opportunities are in sales field engineering, product and application engineering, research, advertising, market development. Widely-respected policies assure recognition of progress and achievement. Address Personnel Manager for preliminary interview at nearest of 17 L&N offices.

two finger action



Any Gilbert radial operator will tell you that the smooth, easy response of controls saves time, cuts down fatigue, and helps boost output. Furthermore, the operator has good visibility of the work **without** raising the head above a comfortable working height, because the spindle axis is close to the front face of the head.

Note clean, compact grouping of controls: (1) speed back gear, (2) speed and feed indicator, (3) head clamp lever, (4) speed change levers control 12 speeds; direct reading plate simplifies selection. (5) adjustable depth stop clamp, (6) spindle power feed is engaged by pulling any turnstile lever, (7) spindle reverse lever, (8) fine feed hand wheel, (9) head traverse hand wheel, (10) power feed engaging lever, (11) feed change levers provide six feeds (twelve with tap heads) shown on direct reading plate.



Inquiries solicited regarding immediate deliveries.

THE CINCINNATI
GILBERT
MACHINE TOOL COMPANY
3366 BEEKMAN ST. • CINCINNATI 23, OHIO

THOSE WHO BUY GILBERT BUY GILBERT AGAIN

The Iron Age

SALUTES

Fred S. Bloom

An engineer-executive, he insists on treating each job individually, with frequent personal inspection.

WHEN Fred Bloom gets the urge to do some drafting—which is often—he doesn't have far to go. The drafting board is just a few steps from his desk. Fred planned it that way. The drafting board was "built into" his office.

Fred, who is president of Bloom Engineering Co., Inc., Pittsburgh, is a lot happier at that board than when he occupies the soft leather seat at his desk. In fact, the leather seat gets very little wear. If he's not at the drafting board, Fred is likely to be out in a mill poking around a furnace where one of his burners is being installed.

Bloom Engineering makes industrial gas and oil burners. It was organized by Fred Bloom in 1935. In the 17 years since, the company has grown from a one-man organization to one of 60 employees. An expansion program begun in 1947 was completed late in 1952. Incidentally, 25 pct of company stock is owned by employees.

Secret of the company's success is Fred Bloom's insistence on engineering his equipment right into the customer's furnace. If necessary he will recommend changes in furnace design in order to give the customer his money's worth. One of his pets at the Bloom plant is the test laboratory where conditions similar to those in a proposed installation are duplicated.

During the summer, Fred spends as much time as he can spare on the golf course. Plays a pretty good game, too—80 to 85.

The happy little Eskimo has POWER STEERING ...why not modern trucks?

"The happy little Eskimo,
He rides upon his sled.
His dogs outstrip the winds that blow
Across the gleaming ice and snow
Beneath the northern lights that glow
Like silver overhead."

Words of song by Frederick Manley.
© Silver Burdett Co., by permission.

As the dog team rushes the sled along, the animals furnish the power for steering. The Eskimo just shouts the arctic equivalent of "gee" or "haw" and the dogs turn the sled accordingly. The Eskimo doesn't have to wrench a steering wheel.

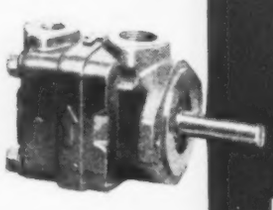
Even when "gleaming ice and snow" are with us, we don't use sleds for transport. But in eliminating primitive haulage, we have lost the power steering. The far heavier manual steering load is on the arm, shoulder and back muscles of the driver. The resulting fatigue causes him to slow down, become less efficient, more prone to accidents.

Vickers Hydraulic Power Steering makes the heaviest vehicle safe and almost effortless to steer . . . even under the most adverse conditions (ruts, soft shoulders, obstructions, flat tires, off-road, etc.). A light finger touch on the wheel is enough . . . steering is no longer a source of driver fatigue. Drivers remain fresh, efficient, safe.

Get further information on Vickers Hydraulic Power Steering; ask for Bulletin M-5100.

VICKERS Incorporated
DIVISION OF THE SPERRY CORPORATION
1428 OAKMAN BLVD. • DETROIT 32, MICH.

Application Engineering Offices: ATLANTA • CHICAGO (Metropolitan) CINCINNATI • CLEVELAND • DETROIT • HOUSTON • LOS ANGELES (Metropolitan) NEW YORK (Metropolitan) • PHILADELPHIA • PITTSBURGH • ROCHESTER ROCKFORD • ST. LOUIS • SEATTLE • TULSA • WASHINGTON • WORCESTER



VICKERS hydraulic POWER STEERING
Is Effortless, Positive and Shockless

4878

The Iron Age

INTRODUCES

Guy J. Coffey, elected president, CHICAGO PNEUMATIC TOOL CO., New York, succeeding the late W. L. Lewis. **Thomas P. Harris** and **James F. Huvane** were elected vice-presidents; and **Thomas F. Noonan**, elected assistant comptroller.

Arch A. Warner, appointed president and general manager, Mechanics Universal Joint Div., BORG-WARNER CORP., Chicago; and **Harry L. Emerson**, appointed president and general manager, Rockford Clutch Div.

R. C. Chandler, elected vice-president in charge of board and corrugated container sales, UNION BAG & PAPER CORP., New York.

B. W. Goulding, appointed vice-president in charge of Compressed Gas Div., THE LIQUID CARBONIC CORP., Chicago.

Robert Purcell, named first vice-president and treasurer, NESCO, INC., Chicago, and **Edward Shultz**, named vice-president in charge of manufacturing.

Allen W. Walz, promoted to executive staff assistant to vice-president-Engineering, ARMA CORP., New York.

Henry W. Fischer, becomes vice-president, WIWOCO CORP., New York.

W. Denis Kendall, becomes executive vice-president and general manager, Brunswick Ordinance Corp., New Brunswick, N. J., wholly owned subsidiary of MACK TRUCKS, INC.

William E. Vaugh, named assistant to the vice-president in charge of sales, AMERICAN CAN CO., New York.

Clayton DuBosque, named engineering assistant to the vice-president and group executive of General Products Group, AMERICAN MACHINE & FOUNDRY CO., New York.

John V. Boardman, appointed works manager, Claymont Plant, THE COLORADO FUEL & IRON CORP., New York; and **Fordyce Coburn**, appointed district manager in charge of operations, E. & G. Brooke, Claymont and Buffalo plants.

William E. Buchanan, elected to the board of directors, ALLIS-CHALMERS MFG. CO., Milwaukee.

Ben Kartman, appointed assistant director of public relations, ILLINOIS INSTITUTE OF TECHNOLOGY, Chicago.

William Patton, becomes controller, PASTUSHIN AVIATION CORP., Los Angeles.

Jack E. Reilly, joins the Industry Engineering Dept., ELLIOTT CO., Pittsburgh.

James E. Barlow, named special staff assistant, General sales office, Louisville, Ky., REYNOLDS METALS CO.

Roderick L. Smith, appointed field engineer, Chicago territory, NORTON CO.

J. H. Brun, appointed director of research, HOOKER ELECTROCHEMICAL CO., Niagara Falls, New York.

Helmut Schelp, named to investigate and screen new products for manufacturers; THE GARRETT CORP., Los Angeles; and **W. T. von der Nuell**, appointed senior project engineer.

JOHN M. BANDEL, appointed vice-president, Electro Metallurgical Co., a division of Union Carbide & Carbon Corp., New York.

ROBERT C. MYERS, appointed director of Market Development, U. S. Steel.

SIGMUND M. MOREY, elected chairman of the board, Morey Machinery Co., Inc., New York.

Personnel

Continued

Russel E. Jacobs, named assistant manager of purchasing and Edward G. Landers, appointed foreman of Stock Dept., THE PLUME & ATWOOD MFG. CO., Thomaston, Conn.

Eric Brierley, appointed sales engineer, Cleveland branch sales office, REED-PRENTICE CORP., Worcester, Mass.

John C. Virden, elected a director, DIAMOND ALKALI CO., Cleveland.

P. J. McArthur, named general manager, Cleveland area, new BRAINARD STEEL CANADIAN DIV., of Sharon Steel Corp.

M. D. Sandine, appointed plant manager, St. Louis, can plants, CONTINENTAL CAN CO. and **C. F. Marquard**, appointed plant manager, Milwaukee metal container plant.

Lawrence L. Weber, appointed assistant to the general traffic manager, PITTSBURGH STEEL CO., Pittsburgh.

E. E. McVeigh, named manager of commercial sales, Western Div., THE BAKER-RAULANG CO.; and **R. T. Tiebout**, named manager of government sales.

R. R. Smith, appointed division manager, Renewal Parts Sales, CUTLER-HAMMER INC., Milwaukee.

Genero A. Noerager, named manager, Washington office, CHASE BRASS & COPPER CO.

John C. Malajan, named sales engineer, Michigan area, UDYLITE CORP.

Kenneth Snyder, appointed Western division regional sales manager, THE ATLAS MINERAL PRODUCTS CO., Mertztown, Penna.; **Edison C. Sickman**, named New York District sales manager; and **Earl A. Erich**, appointed assistant sales manager of Fabricated plastic products.

Thomas J. Mount, appointed general manager, Philadelphia warehouse, CONCORD STEEL CORP.

JOHN E. G. KLINE, named vice-president in charge of process development and patents; Micromatic Hone Corp.

THOMAS J. MENZEL, named manager, Electroplating Section, Hanson-Van Winkle-Munning Co.

ARTHUR J. ALBERT, JR., new manager, pipeline sales, National Tube Div., U. S. Steel.

E. FORREST BAKER, named forging product manager, Kaiser Aluminum & Chemical Sales, Inc.

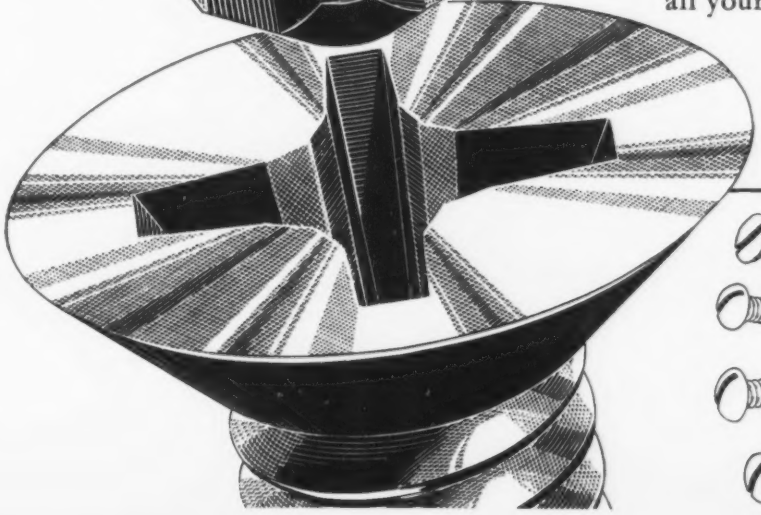
THE AMERICAN STORY

CHAPTER 4:

"The Eagle Spreads Its Wings"

Starting with the early patents on the wood screw, the eagle's wingspread has been steadily extended so that now American has a complete line of Phillips, slotted and special fasteners . . . with prompt delivery in any volume to any part of the country.

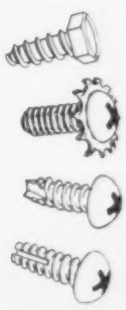
Wood screws, machine screws, tapping screws, thread-cutting screws, lock washer and screw assemblies, hex head screws, bolts . . . or what have *you* in mind right now? Let American lend an experienced hand on all your fastening problems.



AMERICAN SCREW COMPANY

PHILLIPS HEADquarters
WILLIMANTIC, CONNECTICUT

Main Office & Plant
Willimantic, Conn.
Office & Plant, Norristown, Pa.
Office & Warehouse, Chicago, Ill.



This is Inland's stand:

To be large enough to manufacture a wide variety of products for midwestern steel users—yet small enough to give personal, thoughtful attention to each customer.

INLAND

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Technical Articles

Good Setups SPEED STEERING GEAR PRODUCTION

By Herbert Chase
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Output of cam and lever steering gears at Ross Gear & Tool Co. has been facilitated by a variety of unique fixtures and setups. Rough and finish hobbing tools are used on a 100-ton hydraulic press to "plug" tapered serrations in a tapered hole. Wide integral keys on piston rods are produced by hobbing with a formed cutter. Grinding slots in a lever shaft crank is done on a grinder equipped with two fixtures having V-blocks. These blocks support the shaft of the crank and hold the center lines of the slots and the shafts parallel. Cylindrical lands in spool valves are ground by two wheels turning at 1800 rpm on a universal thread grinder. The complete grinding cycle is automatic.

◆ SEVERAL UNUSUAL SETUPS have been devised by Ross Gear & Tool Co., Lafayette, Ind., to facilitate production of their cam and lever steering gears, including a recently developed hydraulic steering gear for use in heavy vehicles.

One of the most unique methods employed is that for producing serrations in a tapered hole. Taper serrations have proved most desirable at the joint between the lever shaft and the crank. Since the 36 serrations required are on the wall of a tapered hole and ordinary machining is impractical, a method called "plugging" is used. It is similar to hubbing except that the basic hole is first machined in the soft alloy steel crank. Final shape is attained in two rapid production operations on a 100-ton HPM hydraulic press.

The finish plug is a duplicate of the serrations on the shaft end that fits into the finished hole. Before it is applied, a rough plug of similar shape is forced into the hole. This produces serrations by forcing the metal to flow into the re-

THE AUTHOR—Mr. Chase, engineer, former trade magazine editor, and author of engineering texts, has been closely associated with industrial developments since 1910.

"On pearlitic malleable iron housings . . . cuts are made with carbide tools at 400 sfpm . . ."

cesses between the spline-like serrations on the plug. The finish plug is slightly larger and brings all dimensions to specifications.

Each plug is forced into the hole and then is forced out, in a second pass, in the reverse direction. Production speed is fairly high as the press exerts ample pressure to cause rapid metal flow.

Ross gears employ a cam whose working faces are those of a variable pitch helix. The thread is cut on a special milling machine with only one roughing and one finishing cut. The high speed steel cutters have two lips that lie along a conical surface. In the finish cutter, the cone is the same as that of the roller cam follower which fits into the thread and moves the lever and its shaft in the assembled steering gear.

Cutters are first fed axially into the cylindrical body of the cam. The cam is supported horizontally in a chuck at one end and on a center at the other. Both the chuck and the center are placed on a table moving on ways parallel to the axis of the work piece. When the rough cutter reaches the proper depth, the work piece is turned slowly and the table is moved on its ways at a varying rate to produce the variable pitch thread or cam surface.

Dial gage checks cams

In the finishing cut a slightly larger cutter turning at about 150 sfpm removes less metal than the roughing cutter and produces a smoother surface. Checking of the cam surface is done with a special dial gage setup. The dial gage indicated the amount of deviation between a master and piece being checked.

After checking, the cam lead is carburized and the parts are transferred to the 12-in. Fay automatic setup, Fig. 1, where the end to be splined and a circumferential groove are turned. In this setup, the end of the shaft is faced and chamfered. Cuts are made with high speed steel tools at a speed of about 53 sfpm. At the same time, the cam body is finish faced to length and the circumferential groove is finish formed.

In the next operation the cam end faces and the cylindrical portions at the end of each cam are ground on a 10 x 18-in. Norton Grinding machine setup, Fig. 2. A stepped A54-M5-V10 Carborundum grinding wheel of 24-in. diam is used. Turning at 24 rpm, the wheel grinds the SAE 8620 steel, hardened to 58 Rc, first on one end then the other, after turning the piece end for end.

Much of the machine work on pearlitic malleable iron housings is done in the Potter & Johnston turret lathe setup, Fig. 3. All cuts are made with carbide tools at a speed of about 400 sfpm. Housings then go to an Oil Gear broach,

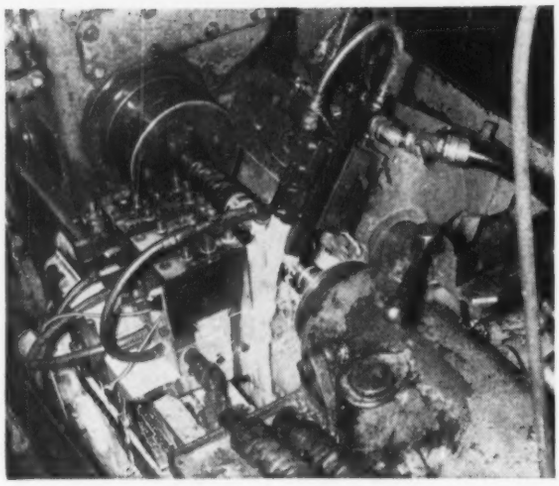

FIG. 1—Fay automatic setup where the end to be splined and a circumferential groove are turned. Cuts are made with high speed tools at 53 sfpm.

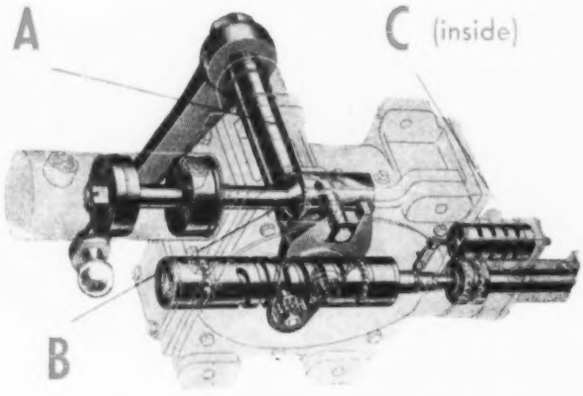

FIG. 4—Skeleton of the recently developed hydraulic type Ross steering gear. In addition to other components photo shows A, B and C described in text.

in which a set of push-pull broaches finish the slide bore in three passes. Cuts are made at a speed of 12 sfpm with a good surface finish.

In the recently developed hydraulic steering gear, see Fig. 4, the crank supported on the lever cross shaft, A, is extended above the shaft. It is slotted to receive a close fitting pin connected to the rod for the hydraulic piston.

A spool valve is located parallel to the piston and to the steering gear shaft but not in line with either. Longitudinal motion of the spool valve, which contains precisely spaced port lands, causes the ports in a surrounding sleeve to be opened and closed in controlling the flow of oil to and from the hydraulic cylinder.

Grinding the slot in the lever shaft crank, B,

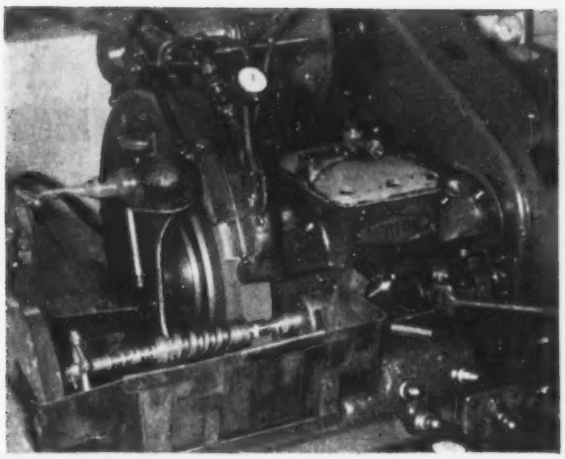

FIG. 2—Ends of the cam are ground on this Norton machine. The work piece is shifted end for end between the first and second passes. A stepped wheel is used.

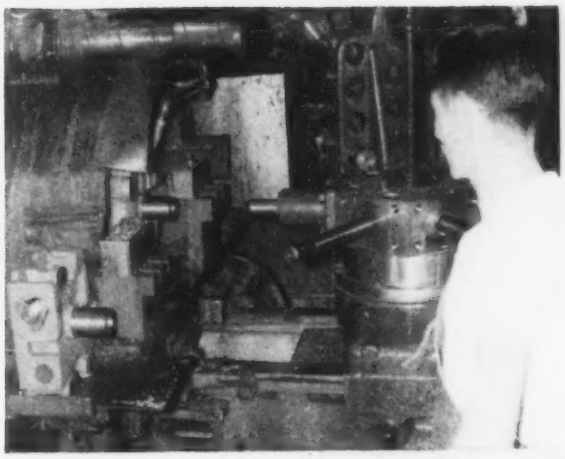

FIG. 3—Several boring and turning operations are performed on pearlitic malleable iron housings by carbide tools in this Potter & Johnston turret lathe.

FIG. 5—Mattison surface grinder equipped with two fixtures to hold crank lever shafts while the sides of the lever slot are ground at one end.

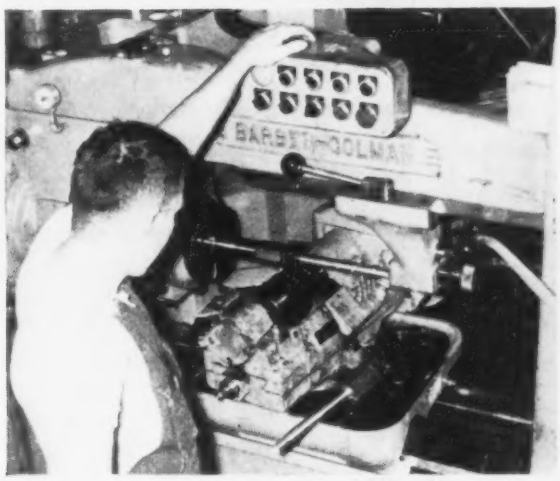

FIG. 6—Hydraulic piston rods have the upset end machined on both sides in two passes by a formed hob in this setup on a Barber-Colman machine.

Fig. 4, is done on a 12 x 36-in. Mattison grinder. The grinder is equipped with two fixtures having V-blocks in which the shaft of the crank is supported so as to hold the center lines of the slots and of the shafts parallel. Grinding, shown in Fig. 5, is done by the sides of a 20-in. Norton 38A46-J5-VBE wheel in such a way that the nominal 1.500-in. width of the slot is held within 0.001 in. tolerance.

Piston rods are annealed SAE 8645 steel forgings having the large end upset. After turning metal is removed at each side of the upset portion to form wide integral keys on which the shaft slides longitudinally. This job is done by hobbing with a formed cutter in the Barber-Colman setup, Fig. 6. The cutter turns at 83 rpm and makes finish cuts in one pass per side. After the first cut, the work piece is indexed 180° for the second cut.

Spools valves, C, Fig. 4, are of SAE 8620 steel having 60 Rc minimum hardness and a series of cylindrical lands. The width and position of these lands are critical because the edges of the lands determine when ports through the surrounding sleeve open and close. A Jones & Lamson universal thread grinder grinds the cylindrical angles on the two center lands at the same time. Two 20-in. Macklin A150-W2-B7 wheels turning at 1800 rpm make the cuts in one pass. In this setup, the complete grinding cycle is automatic and includes the dressing of both wheels at the same time, prior to each cut.

Trouble-free, too—

Stainless Steel Parts Reduce Maintenance Costs

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Maintenance and down-time costs can be reduced substantially by replacing carbon steel nuts, bolts and other parts with stainless steel parts, particularly where such parts are affected by corrosion, abrasion or heat. For example, bolts on furnaces often become locked or "frozen" as a result of the heat. Removal by force will frequently cause the head to break off necessitating the slow, tedious and expensive job of drilling out the bolt. These maintenance difficulties can be avoided by using stainless steel parts.

◆ MAINTENANCE OF PRODUCTION equipment is of primary importance in this day of maximum industrial production. Plant engineers and production superintendents are constantly searching for new ways to hold machine "down-time" to a minimum. Production interruptions mean a tonnage loss and a dollars and cents profit loss.

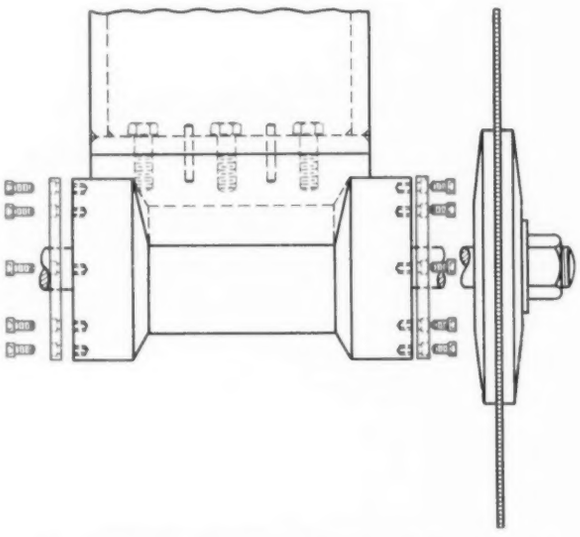
The use of stainless steel in maintenance applications would have been an extravagance years ago but demands for peak production coupled with increased labor costs have changed this conception. Simple production parts, including nuts and bolts, which are subject to the effects of rust, corrosion, abrasion and heat can cause serious production delays if they cannot be removed quickly. When made of stainless steel instead of carbon steel, these parts can be removed easier and faster. Then, too, stainless steel parts resist wear, last longer and require less frequent changing than carbon steel parts. Industrial development will require the use of more stainless steel parts to save lost time and reduce replacement costs.

In the plant of G. O. Carlson, Inc., for example, the work of taking apart specialized cutting machinery has been expedited considerably by using stainless steel for parts that had to be removed easily. Before changing to stainless steel, it took 16 man-hr to remove a cutting machine spindle. By installing stainless steel parts, the time was reduced to less than 2 hr, see drawing.

Use of stainless steel not only cut labor costs but also reduced the number of times these assemblies had to be taken down.

Heat-treating furnaces are used almost universally in industry. It is often difficult to remove parts from furnaces because they are locked or "frozen" in place by the heat. At the plant of G. O. Carlson, Inc., it has been necessary to weld large nuts on the heads of such "frozen" bolts to remove them. Sometimes the force used to loosen the bolt broke off its head. Drilling out the bolt was the only thing that could then be done. This was slow, tedious and expensive. The use of bolt extractors often failed because sufficient force could not be applied. However, making furnace parts of stainless steel, eliminated these difficulties.

If these experiences are duplicated in other plants, a change to stainless steel for many maintenance applications will produce important savings in costs and machine "down-time."



An exposed view of cutting machine spindle assembled with stainless steel parts shown in color. This spindle can now be removed in less than 2 hr. Previously the job required 16 man-hr.

How good is SAP?—

Aluminum Powder Products COMPARED

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Aluminum products made from three grades of sintered aluminum powder were tested in creep-rupture at temperatures from 400° to 900° F for times up to 1000 hr. Included were a coarse atomized grade, M-255, and two types of flake powder with different oxide contents, M-257 and SAP. Materials made from the flake products show unusually good high temperature stability. Extreme gains in rupture life and creep resistance are achieved by use of the powdered aluminum products as compared with conventional forged and cast aluminum alloys.

◆ ALUMINUM manufactured by the powder process can have properties that, for some high temperature-high strength uses, are superior to conventional aluminum alloys. Materials produced from aluminum power retain good strength characteristics at remarkably high temperatures.[1,2,3,4] Little has been published, however, on creep-rupture properties at high temperatures. Purpose of the present work was to obtain creep-rupture data for several aluminum powder products of different particle size and to note some effects of working and heat treatment.

Three powdered aluminum products were studied. One, the SAP sintered aluminum powder product made in Switzerland, was supplied by Dr. I. R. Irmann. The others, M-255 and M-257 were supplied by Aluminum Co. of America as experimental powder metallurgy products.

Creep-rupture properties from 400° to 900°F were obtained on SAP, M-255 and M-257. M-255 was manufactured from coarse atomized powder. M-257 and SAP were made from two flake powders of different oxide contents. Correspondingly wide ranges of high temperature strength and ductility were obtained. The flake powder products are markedly superior in rupture life and creep resistance to the best forged and cast aluminum alloys above about 400°F. Specimen size over fairly narrow limits had no effect on the properties measured for SAP at 900°F.

Temperature, time and stress had little effect

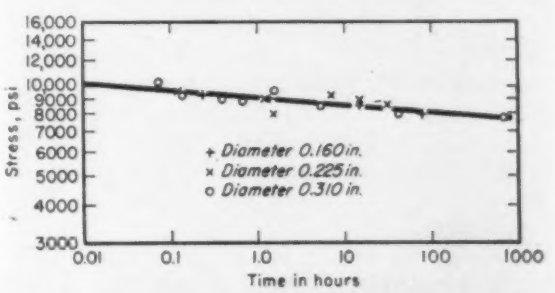

FIG. 1—Effects of specimen size on the stress rupture properties of Sintered Aluminum Powder at 900 F.

"All three materials were first tested in the as-received, hot-worked condition . . ."

on the creep-rupture properties of the flake powder products. Even at 600° and 900°F the slopes of stress versus rupture life or creep rate were unusually flat. Forging of the as-received products and subsequent annealing had considerably different effects on the different materials in creep-rupture tests. Electronmicrographs showed at least a qualitative relationship between structure and strength among the three alloys.

In the sintered aluminum powder product described by Irmann, the initial flake product is so fine that at least 50 pct. of the flakes have one dimension of 2 microns or less. Composition of the starting aluminum shows: 0.18 pct Fe, 0.19 pct Si 0.06 pct Zn, 0.03 pct Ti; Cu, Mn, Mg, nil; balance aluminum. The M-255 bar stock was made from atomized aluminum powder. The M-257 and SAP were flake products.

Table I lists some of the short time tensile data for these three products at room temperature. After an exposure time of 100 hr at temperatures to 900°F, tensile tests at room temperature show litle or no change in properties for SAP. The tensile properties at temperature are also shown in Table II.

Specimen diameter for the creep-rupture tests was reduced from the standard 0.250-in. to 0.225-in. due to fracture in the threaded section. Because of low ductility of SAP specimens at 900°C and the tendency toward intercrystalline cracking, it was believed the size of the specimen might affect rupture time. Notch sensitivity would also be indicated by such changes in specimen size. Tests were carried out on specimens of different diameters and the results are shown in Fig. 1.

All three materials were first tested in the as-received, hot-worked condition. Stress to rupture results are given in Fig. 2. The ability of SAP and the M-257 materials to retain their properties with time at elevated temperatures is shown by the small slope of their stress rupture curves in Fig. 2. Absence of breaks in these curves indicates stability.

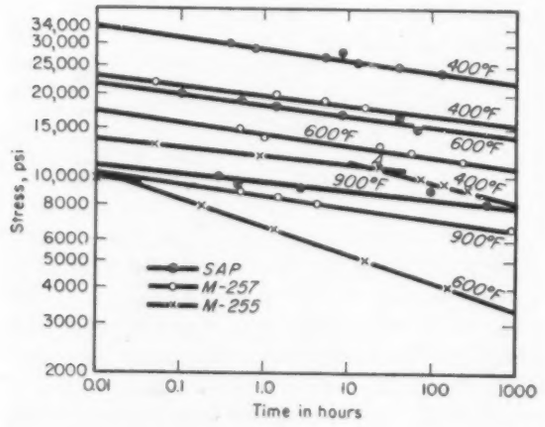

FIG. 2—Log stress v. log rupture time curves for aluminum powder products from 400° to 900°F.

TABLE I

SHORT TIME TENSILE DATA

Alloy	Oxide Content, pct by weight	Tensile Strength, psi	Yield Strength, 0.2 pct	Elongation, pct
M-255*	0.5-1	22,600	17,600	22
M-257*	6-8	35,800	24,600	16
SAP	10-14	50,000	32,800	8

* Data from Alcoa.

Stress rupture properties

Breaks in the rupture curves of M-255 at points A and B, probably denote a transition from low to high temperature type failure. In this respect M-255 behaves similarly to conventional aluminum alloys.

Fig. 3 compares the stress rupture properties of SAP, the strongest of these alloys, and M-255, the weakest product, with one of the best forged alloys, XF 18S-T61 or RR58 and with one of the best cast alloys, SAM, (Special Aluminum Mischmetall).[5] The great superiority of the very fine flake product, SAP, over the conventional cast and forged alloys is obvious. Even M-255 compares favorably at 600°F with XF 18S-T61. M-257 is also markedly superior to conventional age hardened alloys and has a margin of ductility which SAP does not possess at these high temperatures.

Table III compares the stress for rupture

TABLE II

100-HR EXPOSURE EFFECTS
At Temperature and on Cooling

Alloy	Exposure Temp, Deg F	Tensile Strength, psi: At temp	Tensile Strength, psi: At 72° F	Yield 0.2 pct: At temp	Yield 0.2 pct: At 72° F	Elongation, pct: At temp	Elongation, pct: At 72° F
SAP	200	41,000	50,000	35,000	34,200	10	10
	400	32,000	50,000	30,400	34,000	8	9
	600	24,000	49,500	22,000	34,000	5	8
	900	15,000	49,000	14,000	33,000	2	7
M-257	600	16,900	.....	15,000	.....	13	.....
XF18S-T61*	600**	11,000	.....	8,000	.....	49	.....

* XF18S-T61 corresponds to Hiduminium RR58 alloy.
** RR58 at room temperature shows 63,000 psi tensile and 52,000 psi yield (0.2 pct offset). At 600° F the tensile decreases to 17,000 psi and the yield to 14,000 psi after ½ hr exposure at temperature.

times of 10, 100, and 1000 hr at various test temperatures for these alloys. It is evident that for the stress for rupture in 1000 hr, a fine flake product such as SAP will carry almost twice the stress at 900°F that XF 18S-T61 wil carry at 600°F, an advantage of over 300°F. An important item is that at 600°F the forged alloys is losing strength rapidly from overaging whereas even at 900°F the powder product has a very flat slope, signifying its stability.

While creep rate data were not as completely measured, especially in the short time tests, Table IV summarizes the values of stress for fixed secondary creep rates of 0.001, 0.1, and 10 pct per hr.

Sustains higher stress

From Table IV it is evident M-257 can sustain a stress more than twice that maintained by XF 18S-T61 for a creep rate of 0.1 pct per hr at 600°F. SAP, on the other hand, can sustain a stress of three times that of the forged alloy for similar conditions. At creep rates of 0.001 pct per hr and lower, the superiority of the powder products improves rapidly relative to XF 18S-T61 because of the steep slope of the latter alloy at 600°F with changing stress.

Fig 4 shows the relationship for M-255 between elongation, and reduction of area, and the time for rupture. It will be noted that for rupture times, or stresses, corresponding to points A and B in Fig. 2, the elongation and reduction of area drop to much lower values, suggesting a change in the mode of deformation.

Table V lists some of the ductility values for SAP and M-257. At 400° and 600°F, M-257 shows appreciably higher ductility values than SAP. Specifically at 400°F the values for SAP fall rapidly with increasing rupture life whereas they remain quite constant for M-257. The behavior of M-257 as regards ductility is similar at 600°F to that of SAP at 400°F. At 900°F both grades show values of 1 pct or less.

The stability of the fine flake product, SAP, is well illustrated in Fig. 5 by the small effect of annealing the as-received bar stock for 72 hr at 1100°F prior to testing at 600°F. This is also probably true of M-257.

Some of the as-received M-257 bar stock was hot-forged at about 600°F from 0.75 in. diam to 0.5-in., following which the material was tested at 600°F. Forging increased the load carrying capacity, the improvement being better at longer test times. The stress rupture properties of the forged M-257 alloy now approached those of SAP. Annealing for 72 hr at 700°F did not lower the forged stress rupture values, Fig. 5. Significantly the ductility values of M-257 at 600°F after the forging and annealing treatments did not change measurably.

Similar treatments were given M-255. In the newly forged condition strength exhibited at 600°F was inferior to that in the as-received condition although the slopes of the curves were similar. On annealing the forged M-255 material for 72 hr at 700°F, the slope of the curve was decreased. Although the properties did not return to those of the original material, they did improve over the forged conditions as shown in Fig. 5. The reason for this

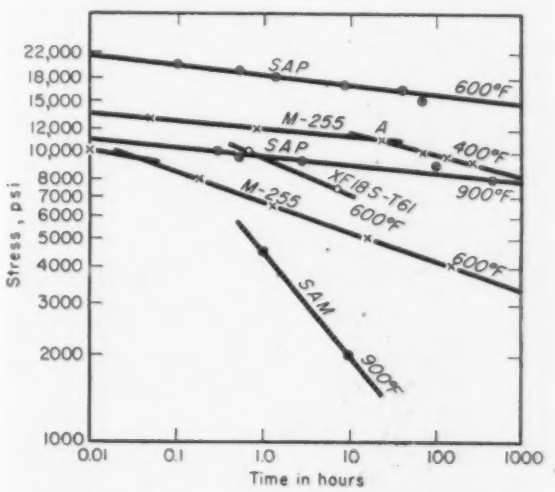

FIG. 3—Comparison of two aluminum powder products with the best forged and cast alminum alloys.

TABLE III

VALUES OF STRESS FOR RUPTURE TIMES

Alloy	Temp, Deg F	Stress in psi for Rupture Life of 10 hr	100 hr	1,000 hr
XF18S-T61	600	7,100	5,500*	4,100*
SAM	900	2,000	900*	.....
M-255	400	11,800	10,000	8,200
	600	5,100	4,200	3,300
M-257	400	18,500	17,000	15,800
	600	13,200	12,000	10,900
	900	7,800	7,100	6,400
SAP	400	26,500	24,000	22,000
	600	16,900	15,400	14,100
	900	9,000	8,400	7,800

* Extrapolated.

TABLE IV

STRESS FOR SECONDARY CREEP RATES

Alloy	Temp, Deg F	Stress in psi for Secondary Creep Rate 0.001 pct/hr	0.1 pct/hr	10 pct/hr
XF18S-T61	600	.....	6,000	10,200
M-255	400	7,500	10,000	12,000
	600	3,500	5,000	7,300
M-257	400	15,400	17,900	20,800
	600	10,800	13,000	15,400
	900	6,100	7,800	9,700
SAP	400	22,000	26,000	30,500
	600	14,900	17,400	19,900
	900	8,000	9,400	10,900

"Inclusions were not found frequently but are apparently a type of defect which can occur . . ."

peculiar behavior has not yet been determined.

To examine more closely the data[6] in Fig. 2, stress was plotted against the parameter T (20+log t), Fig. 6, where T is the temperature in degrees absolute and t is the rupture in hours. The curve for M-255 shows a downward break, confirming an instability in the mode of deformation. The graph for M-257 is a straight line suggesting a stable product over the range of test conditions used.

The curve for SAP is unusual since there is an upward break based on the 900°F data. This suggests an improvement at 900°F which is not predicted by the 400° and 600°F data. This would call for a change in structure or mechanism of deformation and fracture above 600°F, the nature of this change being unknown presently. The curve beyond 600°F in Fig. 6 is drawn dotted on the chance that there may have been a change in the proportion of the bar stock used for the tests at 600° and 900°F.

Fig. 7 shows an unetched transverse section of a bar of SAP, in the as-received state at 2000X. This material under this method of examination did not show appreciable difference in structure in the transverse and longitudinal directions. The large dark partices found throughout the material appeared to be inclusions and not voids. Figs. 8 and 9 show materials M-255 and M-257 photographed under similar conditions.

Figs. 10 and 11 are longitudinal sections showing large inclusions elongated in the direction of working. Such inclusions were not found frequently but are apparently a type of defect which can occur in the powder-products.

TABLE V

ELONGATION AND REDUCTION OF AREA FOR SAP, M-257

As a Function of Temperature and Rupture Life (or Stress)

Alloy	Temp, Deg F	Stress, psi	Life Hr	Elongation, pct	Reduction of Area, pct
SAP	400	30,000	0.38	9	19
		28,000	8.2	5	9
		26,000	13.0	3	6
		25,000	40.0	2.5	3.5
		24,000	123.8	*	1
SAP	600	20,000	0.1	7	11
		18,000	1.35	*	5
		17,000	8.5	*	1
		16,000	40.0	*	*
		15,000	68.8	*	*
SAP	900	10,000 thru 8,000	0.2 to 447	All values less than 1 pct	All values less than 1 pct
M-257	400	22,000	0.05	13.5	32.0
		20,000	1.33	7.3	28.8
		19,000	5.0	10.5	30.0
		18,000	15.7	11.5	22.0
M-257	600	15,000	0.5	9	38
		14,000	1.0	5	23
		13,000	23.7	5	8
		12,450	55.7	4	6
M-257	900	9,000	0.6	.....	.....
		8,500	1.45	.....	.....
		8,000	7.1	*	*
		6,500	88.7	*	*

* Values less than 1 pct.

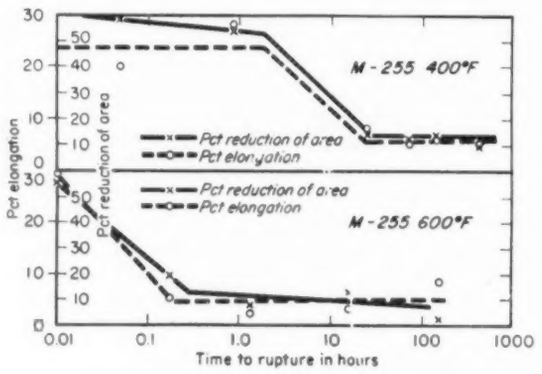

FIG. 4—Effect of rupture life on the elongation and reduction of area of M-255 at 400° and 600°F.

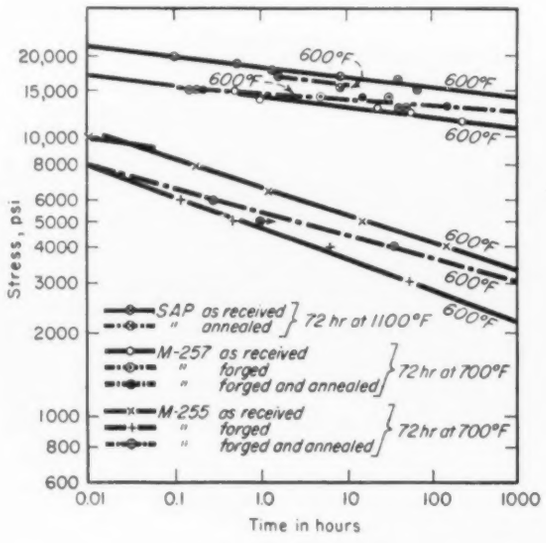

FIG. 5—Effects of forging and annealing on the 600°F stress rupture properties of powder aluminum products.

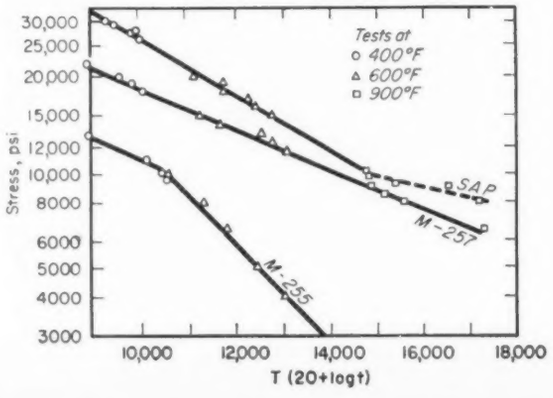

FIG. 6—Plot of stress v. the parameter T (20 log t).

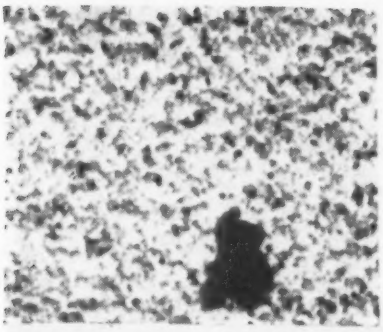

FIG. 7—SAP, transverse section in as-received condition, unetched.

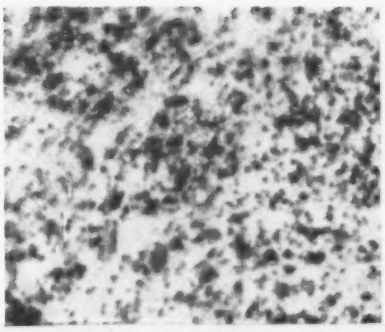

FIG. 8—M-257, transverse section, in as-received condition. Specimen unetched. 2000X

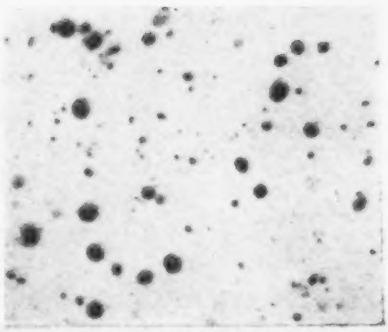

FIG. 9—M-255, transverse section, in as-received condition. Specimen unetched. 2000X

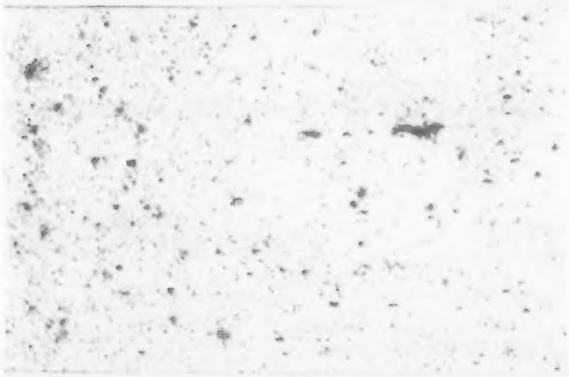

FIG. 10—SAP, longitudinal section, as-received. Unetched. 200X

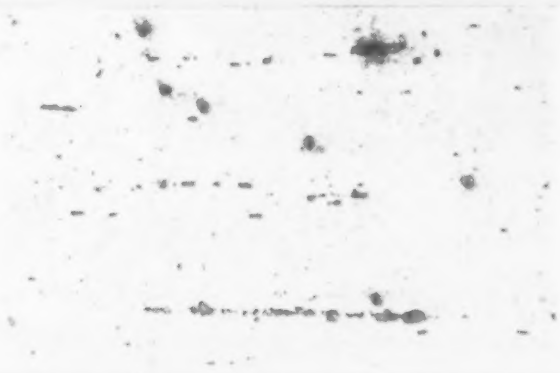

FIG. 11—M-257, longitudinal section, as-received. Unetched. 200X

FIG. 12—SAP, transverse section, as-received, unetched. Parlodion negative replica, shadowed with chromium. 20,000X

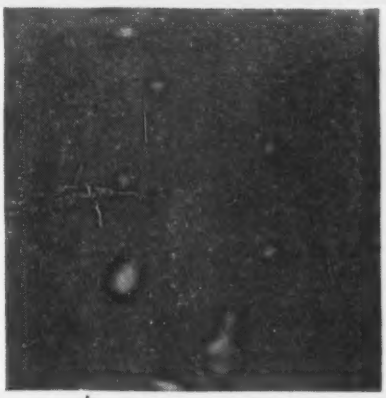

FIG. 13—M-257, transverse section, as-received condition. Replica, shadowed with chromium. 20,000X

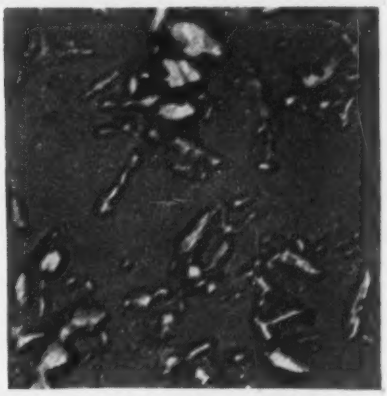

FIG. 14—M-255, transverse section, as-received, unetched. Parlodion negative replica shadowed with chromium. 20,000X

Owing to the extreme finenes of the structure of these products, a magnification of 2000X was not sufficient to permit accurate measurements of the size of the hard particles or of the dispersion of the phase. Electronmicrographs, however, give a clearer picture of the size and amount of the disperse phase.

Electronmicrographs, Figs. 12, 13 and 14, 20,000X, show a decrease in the amount of disperse phase in the order SAP, M-257, and M-255. M-255 made from atomized powder has more globular oxide particles than have M-257 and SAP, which are made from tamellar powders obtained by stamp-milling.

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[3] R. Irmann, L'Aluminum Fritte a Haute Resistance a La Chaleur. Revue de L'Aluminum, Sept. 1951, Vol. 28, No. 180, p. 311.

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[5] Loring, Baer and Akerlind, High Temperature Aluminum Alloy, Metal Progress, Vol. 67, June 1952, p. 162-164-166 (Condensed from A Mischmetal Aluminum Alloy for Elevated Temperature Service). Naval Research Laboratory Report 3871, Nov., 1951.

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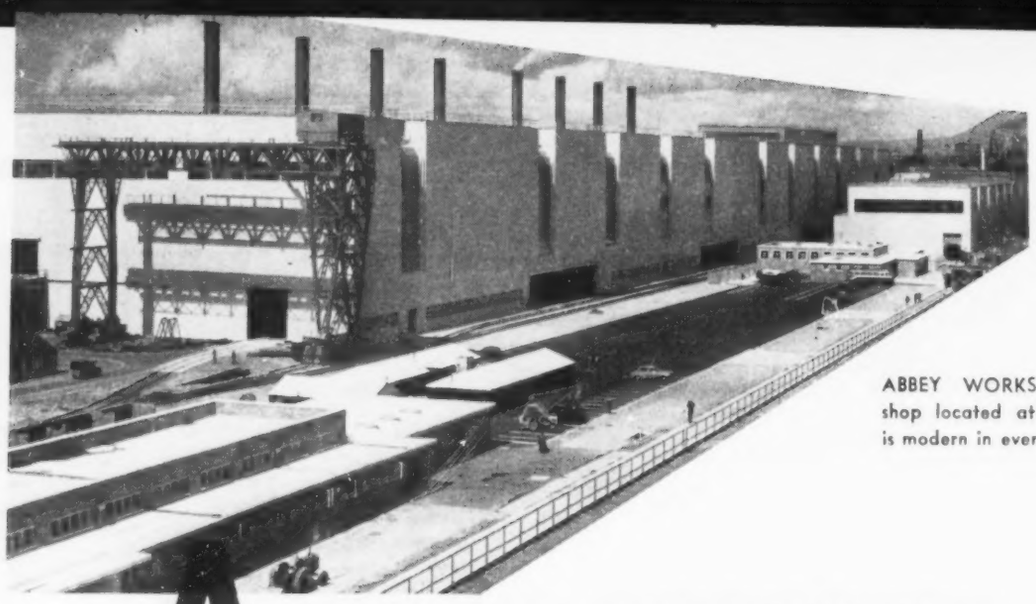


ABBEY WORKS melting shop located at Margam is modern in every respect.

AMERICAN EQUIPMENT
Increases Britain's steel output

New continuous mills built at cost of $70 million antiquate pack-mills of South Wales. Former output of 200 to 300 boxes of tinplate per week has been raised to 140,000 boxes per week. Ingot capacity of Margam Steelworks is now 1½ million tons. Great part of the mill equipment was built by United Engineering & Foundry Co.

◆ BRITISH STEEL PRODUCTION made a big step towards its 16,500,000 ton 1953 goal when American built machinery recently took over a substantial part of steel and tinplate production. The rejuvenated Margam Steelworks and nearby Troste Tinplate Mills are the first completed phase of the countries $700,000,000 steel production reorganization scheme.

South Wales, home of British tinplate manufacture, still relies on old pack-mill methods for more than 70 pct of its output. Former output was counted by the 200 to 300 boxes a shift, compared to the 140,000 boxes a week from the Pittsburgh-built continuous strip mills now installed.

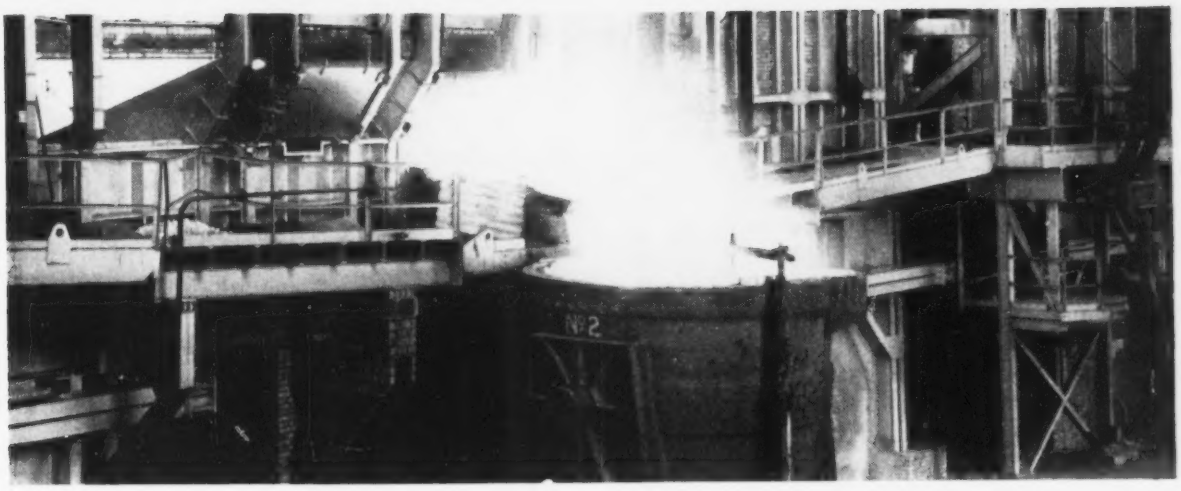
The South Wales plan called for reconstruction and enlargement of blast furnaces, coke ovens and coal and ore handling plant at the Margam Steelworks to produce the greater quantity of pig iron required and also to erect, adjacent to the Margam works, an 80 in. continuous strip mill, melting shop and ancillary equipment as well as a tinplate mill at Troste. Now completed, the Margam Steelworks will produce 1,500,000 tons of ingots annually and Troste 140,000 boxes of tinplate weekly from some 7000 tons of cold rolled coil supplied by the steelworks. Total steelworks production is assessed at 15,000 tons of coke, 19,000 tons pig iron, and 30,000 tons of steel, weekly.

Part of the scheme called for the erection of two cold reduction mills, and a modern tinplate plant. One cold mill was placed alongside the continuous mill at Margam. The other, together with the tinplate plant, was built at nearby Troste. Initial work was commenced in 1947 but the plant was still not considered completed when opened on Oct. 18.

New openhearth furnaces have been constructed and there are now twelve 80-ton fixed furnaces, and eight 200-ton oil fired furnaces. Bath furnace area of the larger furnaces is 770 sq ft and depth 31 in. Oil consumption per furnace charge averages 5000 gal.

Up to 20-ton ingots are poured. Ingots are heated in pits fired by coke oven and blast furnace gas. There are 20 soaking pits, 15 ft x 14 ft 3 in. and 11 ft deep at this plant.

Ingots are slabbed on a 45 in. mill. A 800 hp ac vertical edger mill is located 95 ft beyond the main mill. Before re-rolling, slabs pass through one of three reheating furnaces of the triple-zone type each 93 ft, 9 in. long by 20 ft, 3 in. wide. Furnace capacity is 105 tons per hr. The



TAPPING one of the 200-ton new openhearth furnaces.

slabs move on water cooled skids through the full-furnace length.

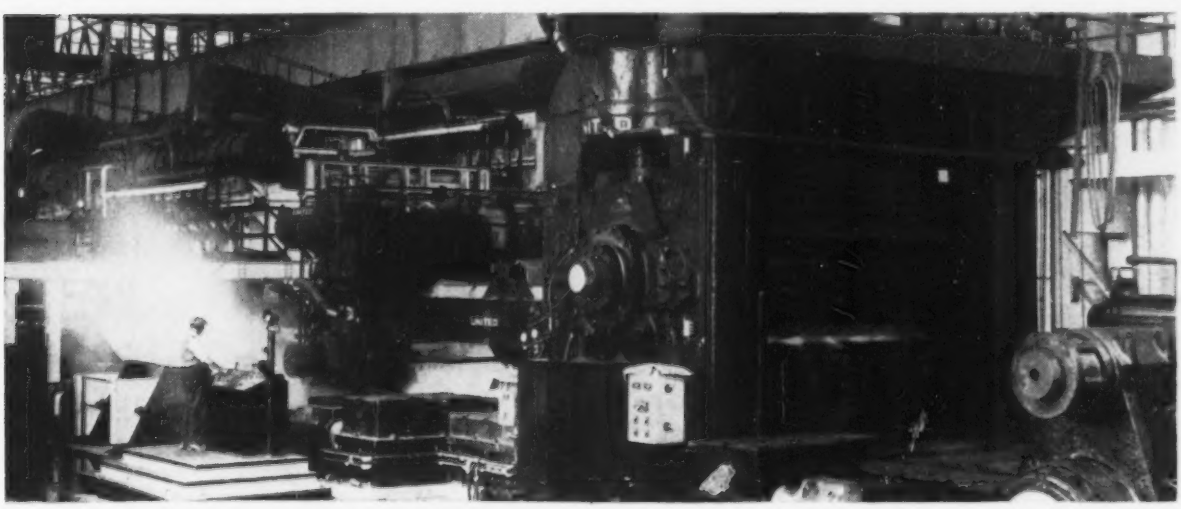
After passing through scalebreaker, slabs enter first roughing stand. This broadside-mill can cross roll to increase slab width to 72 in. which is the mill limit. The broadside has 54 in. diam back-up and 27 in. work rolls. The temperature control table between last roughing and first finishing stand is 186 ft long. There are six of these finishing stands. On emerging from final finishing roll, strip is delivered from the last of the six finishing stands at 2000 fpm. Combined horsepower of continuous mill is 46,000.

At Margam, strip is cold rolled on a 3-stand mill into sheets suitable for automobile bodies, metal furniture, refrigerators, etc. At Troste, it passes through a 5-stand mill before being manufactured into tinplate.

Power is received at this works via four 66,000 v overhead lines and primary distribution is 11,000 v within works. Secondary distribution is 3300 v supplied from a 3500 kva, 11,000-3300 transformer. Low tension ac current is a 415 v, 3-phase, 4-wire system. Direct current is supplied from pumpless steel tank mercury arc rectifiers arranged in 1600-kw units throughout the works.

Hot rolled coils are supplied to the Troste plant in various steel quantities as scheduled by the cold reduction plant. Maximum coil weight is 15,000 lb, maximum gage, 0.093 in. and width, 38 in. Conveyer-delivered to uncoiler they are subjected to reverse bending operations to break scale. After levelling, coil passes to strip end-trimming shears. To make the pickling operation continuous, trailing edge of one coil is attached to leading edge of next by alternate electric welding and stitching.

The cold reduction mill operates at a top speed of 4500 fpm. It comprises five mill stands, in tandem, equipped with work rolls 21 in. in diam of 43 in. body length. Back-up rolls are 53 in.



SCALEBREAKER and broadside mill with reheating furnace, left background. Broadside mill cross rolls slabs to 72 in. maximum width. Broadside has 54 in. diam backup and 27 in. work rolls.

diam by 47 in. long. Horsepower of dc drive motors for each stand is: No. 7 stand, 1750; No. 2 and No. 3 stands, 3500 each; No. 4 stand, 4500; No. 5 stand, 5500. The reel is equipped with a 900 hp motor.

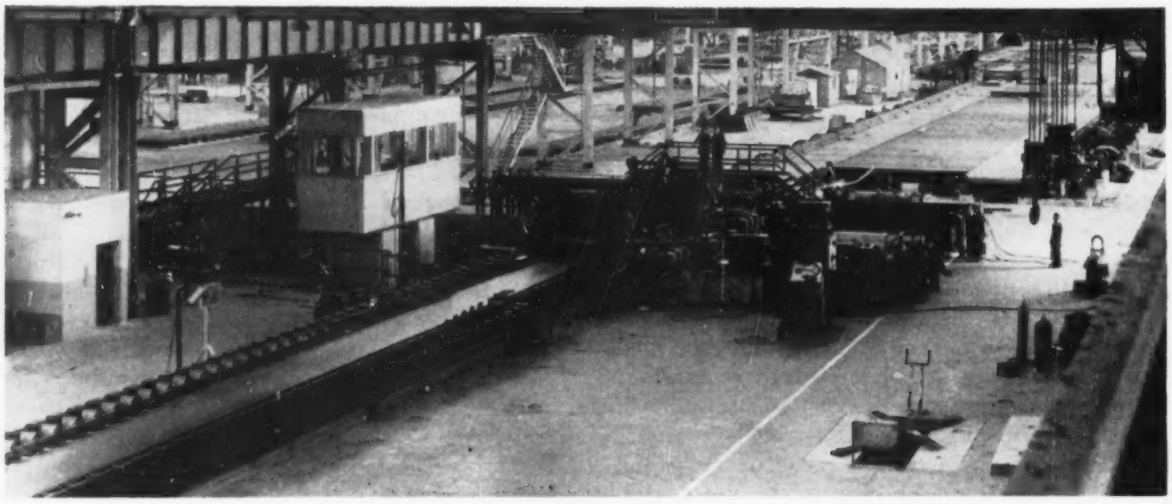
Vapor and fog produced by water used to control roll temperatures is exhaused into fog eliminator systems and stack-discharged to atmosphere. Palm oil and water mixture, used during the process, drains to basement and enters a reclamation unit for eventual reuse. Water is cooled and recirculated.

All traces of oil are removed from strip prior to annealing by two electrolytic cleaning lines. This comprises a 22 ft-caustic dip washer, a scrubber, and then electrolytic cleaning. After this cleaning it enters a second scrubber, through wringer rollers before reaching hot-air drying section. Cleaning speed is 2000 rpm.

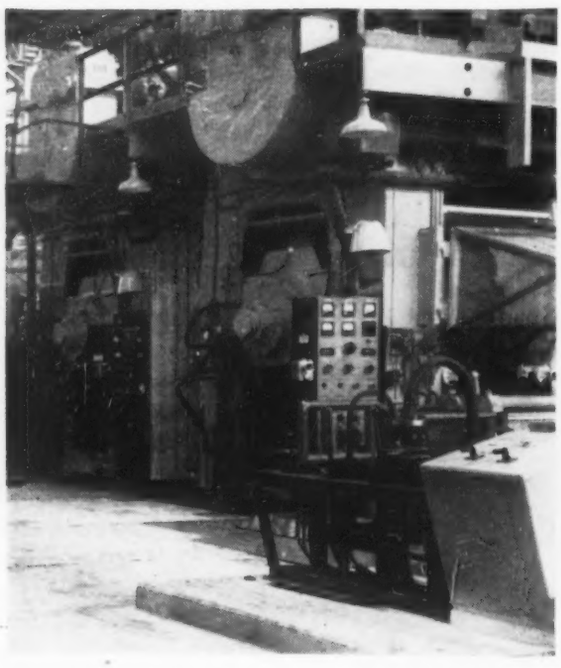
"Traces of oil are removed from strip prior to annealing by two electrolytic cleaning lines . . ."

Batch-type annealing furnaces are placed in rows in which coils are stacked four high. Total furnace charge is about 200 tons. There are five annealing furnaces each fitted with 30 burners. Temperatures are automatically controlled. During heating and soaking cycle inert NX gas is fan-circulated to inner furnace covers to prevent oxidation.

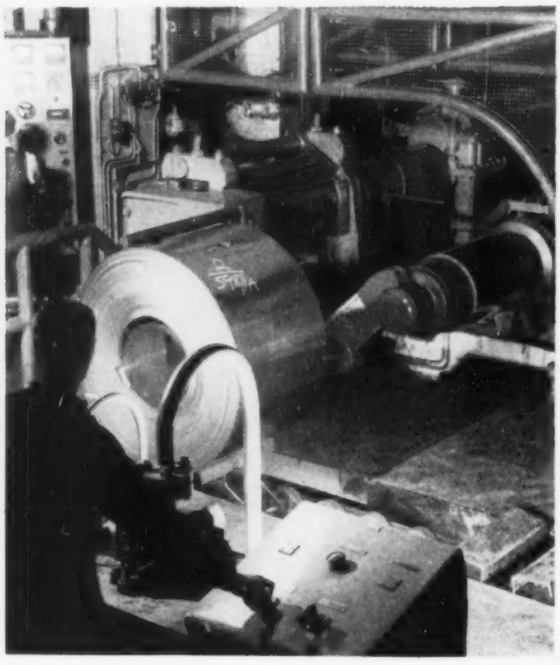
Following annealing, strip is cold rolled by



RUNOUT TABLES and coilers at Abbey Works. The maximum coil weight is 15,000 lb.



TEMPER MILLS. One of two, both American built, which are 2-stand, 4-high type.



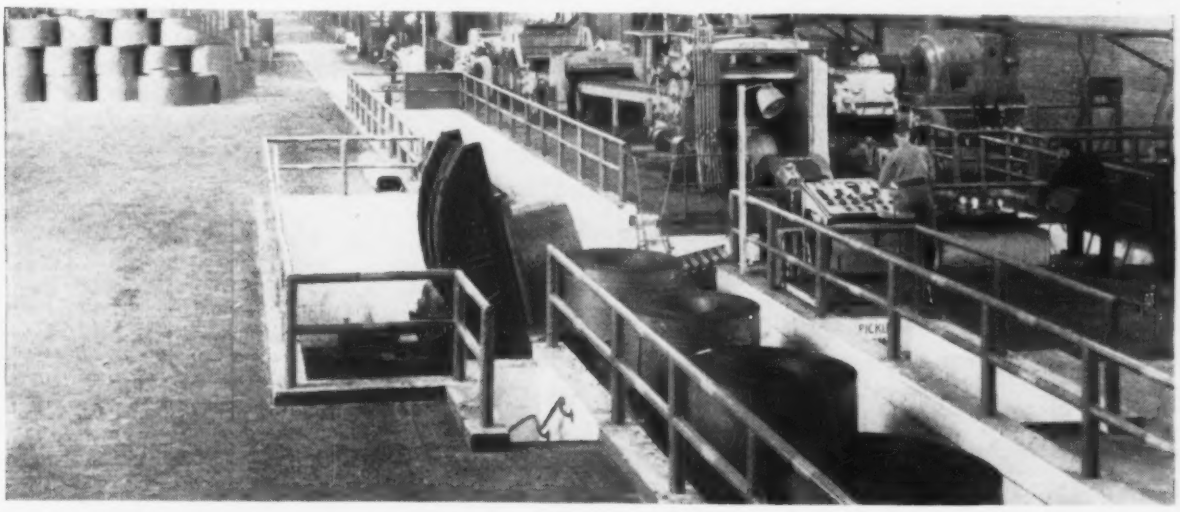
DELIVERY SIDE of one of the temper mills. Work rolls on this will measure 18 in. diam by 43 in. Back rolls are 53 in. diam by 47 in. long.

"Electro-chemical chromic acid prevents discoloration on lacquering and during storage . . ."

two more American-built temper mills, each of the 2-stand, 4-high type. Coils for hot dipping are fed through a side trimmer equipped with rotary knives adjustable from 14 to 38 in. Sheared plates pass through a classifier where off gage and perforated sheets are automatically stacked in one pile, "primes" in another.

Coils destined for electrolyte tinning pass through two preparatory lines at a speed of 1800 fpm. From these it enters the continuous tinning unit consisting of two acid "Ferrostan" lines handling 30,000 lb coils which tins ½ lb coatings at 800 rpm. Pinhole and off gage detectors automatically eject sub-standard material at line-end.

After cleaning, strip enters tinning zone consisting of five plating and one dragout tank where strip is washed and electrolyte recovered for further use. Low voltage current is used. Strip then enters flow-melt unit where it is heated to allow tin to flow onto the surface and give it its finished and bright appearance. Final treatment is in the electro-chemical chromic acid unit which prevents discoloration on lacquering and during storage. Strip is covered with a fine cotton seed oil emulsion before storing. Finally it is sheared into required widths and classified by visual inspection.



CONTINUOUS PICKLE line at Troste includes ultra modern equipment. Conveyer delivery system is shown in foreground. Strip travels through this line at 500 fpm.

FIVE-STAND COLD MILL operates at a top delivery speed of 4500 fpm.

Doing double duty—

Floating Die Table EQUALIZES PRESS ACTION

The action of a floating die table and a descending upper punch have been applied to punch press design to produce the same compressive forces obtained with a dual-punch press. The pressure created between the upper and lower dies is applied to powdered metal particles to form a part of uniform density throughout. Presses equipped with a floating die table can form pieces of relatively deep elevation. Application of this method avoids the excessive expense for a dual-punch press of a large size.

By George Karian
Application and Design Engineer
F. J. Stokes Machine Co.
Philadelphia

◆ UNIFORM DENSITY of metal powdered parts is highly important. Powdered metal parts do not go through a liquid phase but are made up of a given quantity of minute particles compressed or briquetted. When liquid phase metals flow or fill a given combination of contours, cross sectional uniformity and homogeneity are critical factors. The flow of powder particles in making a compact is just as critical as that experienced in the liquid phase metals if the desired engineering parts are to be consistently achieved.

The most important factors determining this consistency is the means by which pressure is applied to the powder and the direction from which that pressure is applied. If only the upper punch moves in a powdered metal die assembly, a certain amount of wall friction develops as the material is compressed. This reduces the pressure so that the metal particles at the bottom of

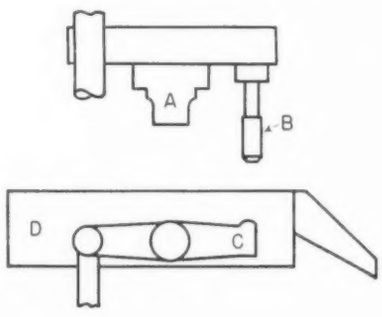


FIG. 1—Drawing shows essential elements of floating die table on a Stokes Model 294 Powder Metal Press. A is the single descending punch. B is the depressor moving with the punch and striking boss C on lever attached at its midpoint to die table D. The table moves downward at one half of punch speed and imparts pressure equally from top and bottom to metal powder.

the cavity are subjected to decisively less compacting force. Tensile, compressive and flexural strength are all seriously impaired.

Single-punch presses, with either an upper or lower punch compressing the powder in a die are satisfactory for powder metal pieces of shallow elevation. For thicker pieces, such as oilless bearings which require even density for both structural and absorptive reasons, it is imperative that the compressed powder be uniform in density from top to bottom regardless of the thickness of the piece. This cannot be done with single-punch presses of conventional design because die-wall friction is a function of punch movement and affects compression in the area of punch movement.

Top and bottom punches

Two press designs have been used to overcome this difficulty and achieve practical uniform density. The simpler of these methods uses dual punches by which one descends from the top and the other ascends from the bottom to compress the powder in the die with equal force from both directions. This method produces pieces of uniform density from top to bottom. However, the dual-punch press is impracticable in some applications and intolerably expensive in larger sizes.

An alternate method achieves the desired result without the large expense. It is used in certain presses designed especially for forming powder metal pieces of relatively deep elevation. These presses have a floating die-table which is driven down mechanically and positively by a member supported on the press frame, actuated by the descending upper punch, and pivoting at its mid-point on the die-table, Fig. 1. Thus, the die-table descends at exactly one-half the speed of the upper punch. The lower punch is stationary and the upper punch and the charge of metal powder descend upon it.

The effect of this action divides the die-wall friction between the moving upper punch and the stationary lower punch and creates a mass of uniform density from top to bottom. Theoretically, it is slightly less dense in the middle section; practically, it is uniform for the design-purpose from top to bottom.

The moving die-table and the moving upper punch give the same motions and the same pressure relative to the mass of powder to be compressed as would be given by two punches moving from top and bottom simultaneously at identical speeds.

The condition is graphically compared in Figs. 2 and 3. Figs. 2A, 2B, and 2C show the position of the two punches in a double compression press, at fill, half compression, and full compression. Figs. 3A, 3B, and 3C show the corresponding positions when using a floating die-table and a stationary lower punch. Figs. 1B and 1C are identical with 2B and 2C except for the position on the paper. The relative position of the part is exactly the same at all times and the floating die-table has produced the exact equivalent of simultaneous compression from above and below. This is also shown by the posi-

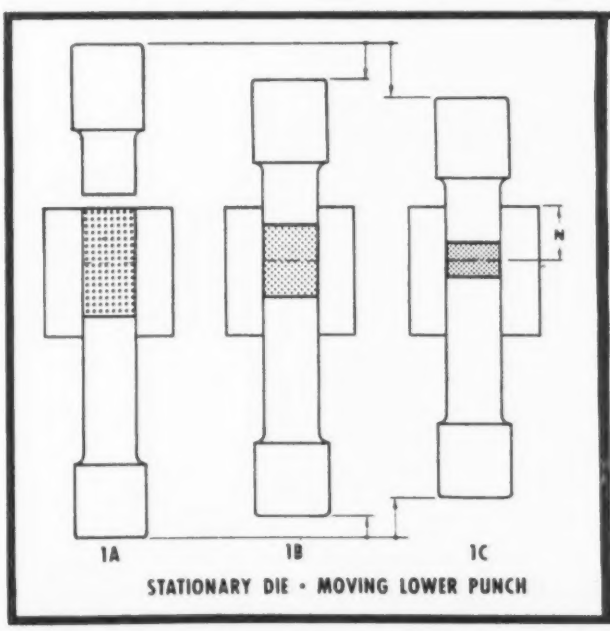


FIG. 2—Upper and lower dies of a dual-punch press at fill, half compression and full compression.

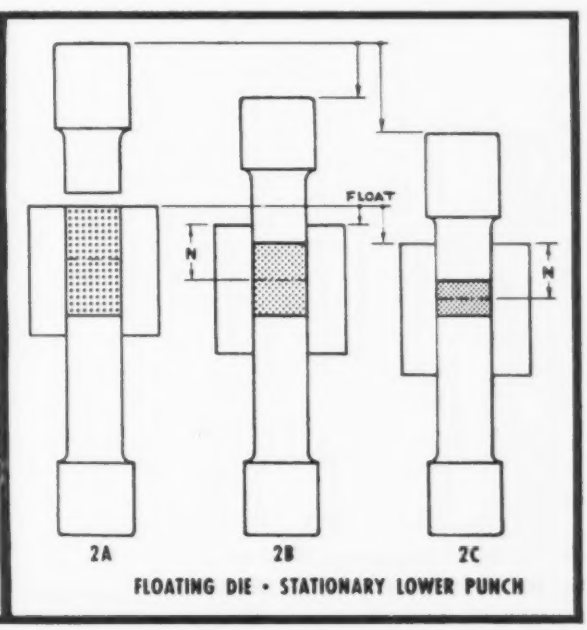


FIG. 3—Floating die table and stationary lower punch at fill, half compression and full compression.

"Uniform density depends on the mechanical actuation of the die-table . . . The mechanically actuated table moves positively . . ."

tion of the neutral layer N in respect to the top of the die. In some materials this neutral layer is readily visible and the pieces produced by one method are identical in appearance with those produced by the other method.

Uniform density depends on the mechanical actuation of the die-table. An approximation of the effect may be achieved with a spring-floated table but in this type of press the springs resist downward movement until the wall friction between the upper punch and the die have overcome spring tension. There is, therefore, more compression from above than from below and the piece is less dense at the bottom than at the top. The mechanically actuated table moves positively; the springs which support serve only to push it back to the starting position for the next compression.

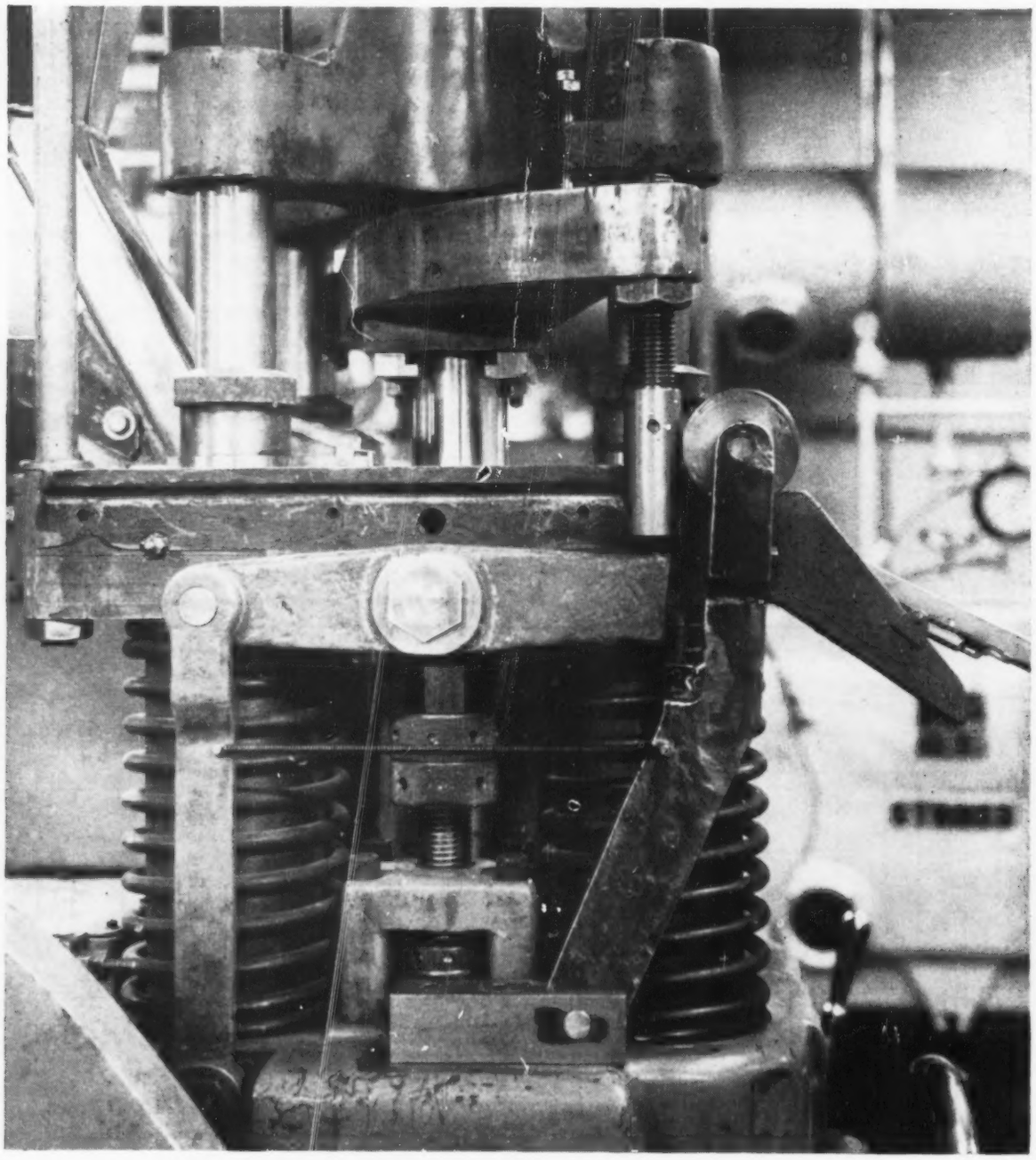


FIG. 4—Close-up of floating die table which provides equal pressure from top and bottom of a piece.

Tube replaces bar—

Bushings From Tubing

Have Finer Finish, Cost Less

◆ AIRCRAFT BUSHINGS usually fall within 0.190 in. to 0.375 in. ID, their shape is not complicated and the quantities required ordinarily favor mass production. Under these circumstances production of aircraft bushings for the Navy would seem to be a relatively easy matter. However, the job is complicated by rigid Naval Aircraft Standards which call for a tensile strength of 125,000 to 145,000 psi, tolerances of 0.001 in. on ID and ± 0.00025 in. on OD and a maximum surface finish of 100 microinch. This smooth finish is required since most bushings are used as bearings for control rods and metal to metal friction from the twisting or sliding action of the rods must be kept at a minimum. In addition, the bushings are subject to severe vibration and minute cracks or surface defects could easily result in failure.

Production of the 100 microinch finish on the ID was a major problem at Aircraft Products Co., Bridgeport, Pa. Following the usual practice among bushing manufacturers, they used bar steel as raw material and drilled and reamed the bushing ID. Although extreme care was taken in reaming, rejects averaged 30 to 35 pct, and this high rejection rate was a major factor in production costs.

To overcome this difficulty it was decided to substitute cold drawn tubing of the correct ID for bar stock and eliminate drilling and reaming entirely. Superior Tube Co., Norristown, Pa., supplied aircraft quality tubing drawn to the exact ID size and finish to meet NAS specifications. Aircraft Products then began to produce aircraft bushings from tubing instead of bar stock. The internal surface of the cold drawn Superior tubing was consistently smoother than NAS specifications and bushing rejects dropped from one third to almost zero. Production time was saved, no drilling and reaming were needed.

Flanged bushings, shown in Fig. 1, are produced on a No. 3 Warner & Swasey turret lathe and Brown & Sharpe automatics. First step is to face the front end and machine a 45° bevel on the edge. The OD is then turned down ¼ in. to a flange, followed by the final cutting-off operation. All bushings are inspected with a Profilometer prior to cadmium plating. Examples of bushings produced by this method are shown in Fig. 2. Except for occasional orders for odd sized bushings most are now produced by Aircraft Products from Type 4130 chrome molybdenum tubing. Ten sizes ranging from 0.312 in. OD and 0.190 in. ID to 0.500 OD and 0.375 in. ID are carried in stock to fill bushing orders for military and commercial aircraft.

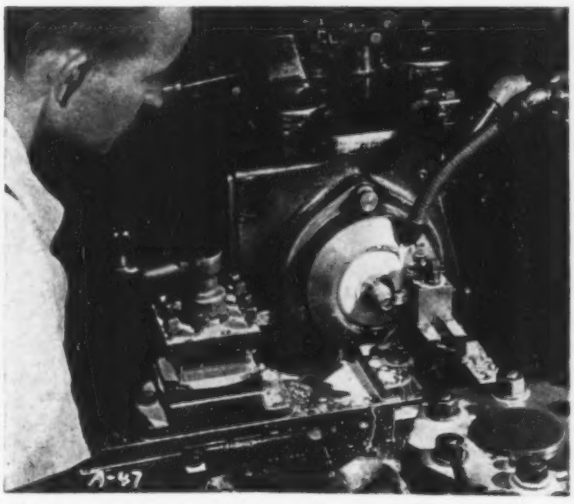


FIG. 1—Facing front edge of bushing and machining a 45° bevel on outside edge. Use of tubing instead of bar stock eliminated drilling and reaming.

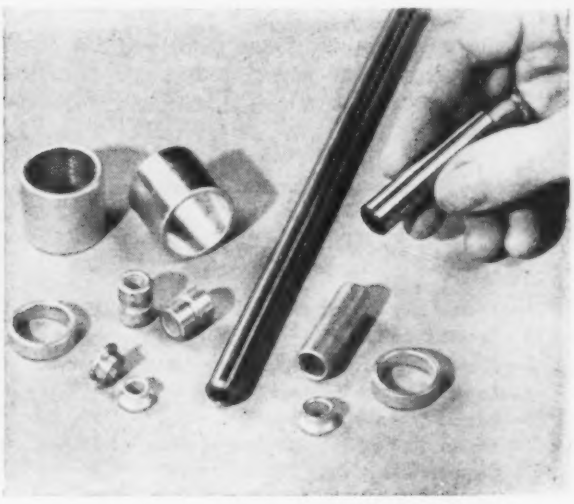


FIG. 2—Bushings of many sizes and shapes are produced from tubing at Aircraft Products Co. Typical lengths of tubing is shown in center of photograph.

Push button furnaces—

TIMKEN APPLIES INDUCTIVE

Following the lead of Swedish quality steel makers Timken has applied the stirrer to large electric furnaces. Experiences to date confirm all claims made for the device. Better quality steels of more consistent chemistry made in faster time are now possible at Canton. Control of carbon is so accurate that Timken can now tap heats to any particular point of the carbon range. Grain size control is also more precise because the aluminum content is under strict control. Using a two slag practice this shop is tapping heats 25 min after slag-off.

◆ FIRST ELECTRO-MAGNETIC inductive stirrer to be used on an electric arc furnace in the U. S. A. and the largest unit of this type in the world started operation on September 29, 1952 at Canton, Ohio. This 20-ft top charged furnace is one of three such units installed by The Timken Steel and Tube Division of The Timken Roller Bearing Co. The replacement of three 125-ton open hearth furnaces with three modern 20-ft top charge electric arc furnaces was dictated by economic factors and the demand for additional high quality electric furnace alloy steel. The expected increase in production with the new units is about 75,000 tons annually for a total of 625,000 tons of all electric steel.

Twelve direct current motors and seven motor-generator sets are utilized in running the furnace and the inductive stirrer. The unit with a full heat of steel weighs about 400 tons —the stirrer alone weighing 25 tons. Three separate water systems are employed for cooling the furnace and associated equipment. Included are a recirculating distilled water system for the stirrer, plant deep well water at 56° to 90°F for furnace coils and other miscellaneous cooling.

The induction stirrer device is a water cooled coil resembling a segment of the stator of a large two-phase induction motor. The stirring coils are encased in a steel container, or box, which is curved lengthwise only to fit the furnace bottom contour. The top of the stirrer container is covered with a layer of Kaocast, 1 to 1½ in. thick, which serves as an insulator.

The stirrer assembly, including coils and container, weighs 51,000 lb. The coil is protected from possible adverse effects of overheating by a warning system which is temperature actuated. This system consists of thermocouples installed at 14 points in the coils, and 20 positions on the furnace bottom, and one which indicates the temperature of the water in the coil cooling system. These temperature measuring devices are set to trip an alarm system if a predetermined maximum safe temperature is exceeded. When the alarm system for the furnace bottom is tripped, a horn will sound and the stirrer will automatically be stopped. If the coil or its coolant have become overheated, a bell will sound and the stirrer will also be stopped. Signal lights indicate the nature of the trouble and the exact hot spot may be found by manipulation of indicating temperature dials on the panel board which may be connected into any one of the thermistors.

Current is supplied to the stirrer by a special 2-phase .55 cycle commutator type generator rated at 485 KVA at .43 PF, driven by a 400 hp., 2300 v synchronous motor. Excitation is provided by a Swedish built Schrage phase and

SWEDISH CLAIMS

Table I

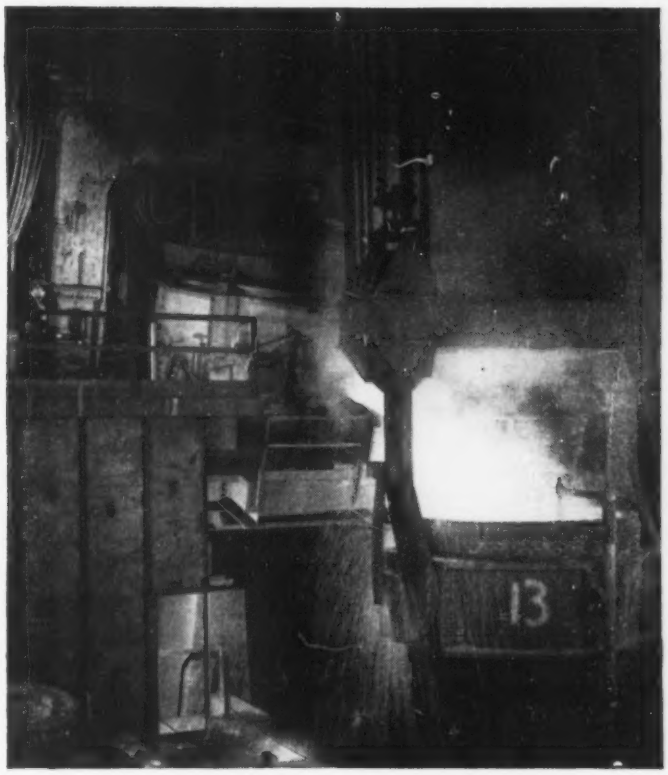
1—Closer control of chemistry.
2—Lowers sulfurs.
3—More accurate temperature measurements.
4—Lower oxygen content.
5—Faster metal-slag reactions.
6—Faster and better solution of alloy additions.
7—Cleaner slag-offs.
8—Lower phosphorous content.
9—Cleaner steel—less inclusions.
10—Shorter heat times.

TIMKEN'S EXPERIENCE

Table II

1—Closer control of chemistry, particularly carbon range.
2—Sulfurs run 25 pct lower.
3—Better solution of alloy additions.
4—Homogeneity of bath reached in less time.
5—More even bath temperatures.
6—Faster slag making during finishing period.
7—Less labor involved in slag-off.
8—More consistent grain size.
9—Use same KWH per ton as regular furnaces.
10—Faster heat times.

STIRRING to 80-Ton Electric Furnaces



TAPPING one of the new 20-ft top charge electric arc furnaces at The Timken Roller Bearing Co. This swinging roof furnace uses the first electromagnetic inductive stirrer on an electric arc furnace in the United States. Bath depth is 40 in. and furnace bottom is made of 1¼ in. stainless type 304 plate. Furnaces have 10-in. Ramset bottoms over 12 in. of magnesite plus a 9-in. course of fireclay.

frequency converter with rotating primary and regulating windings and stationary secondary winding. Two power levels are available for stirring action, 215 KVA at 150 v and 390 KVA at 200 v. The moving magnetic field generated by the current flowing in the stirrer coils may be caused to move in either of two opposite directions so that the metal flow in the furnace may be directed up at the spout or up at the slag-off door.

The decision to install an Inductive Stirrer on the first of the new 20 ft Electric furnaces at The Timken Roller Bearing Co. was based on an investigation of claims made by Swedish producers, who were using the device, that important economic and metallurgical benefits were obtained.[1]

[1] E. S. Kopecki, "Induction Stirring for Electric Furnace Steelmaking," The Iron Age, Sept. 22,1949, p. 74.

In electric arc melting practice inert molten metal baths during the refining period are undesirable. Alloying elements tend to stratify and temperature distribution lacks homogeneity. Accurate sampling of the melt thus is practically impossible. Various manual and mechanical methods are now employed to obtain some mixing and stirring action of the metal and slag but in most cases the effects are only temporary. A better and more flexible method was obviously necessary to improve quality alloy steel production, particularly in the large melting units.

The purpose of the stirrer is to induce movement of slag and metal at a speed and direction desired by the operator. The electric currents in two phases induce electric current paths in the liquid steel bath as shown in sketch. At the same time the two phases generate a moving magnetic field which reacts upon the steel composing the current paths with forces parallel to the furnace bottom.

Reports from Sweden, see Table I, indicated many benefits gained through using inductive stirring.

Until Timken built its new furnaces experience with inductive stirrers had been on small furnaces. The decision to place a stirrer on a large, high powered furnace was a bold, forward move. The desire, however, for improving metal quality to produce better bearings, rock bits and other end products de-

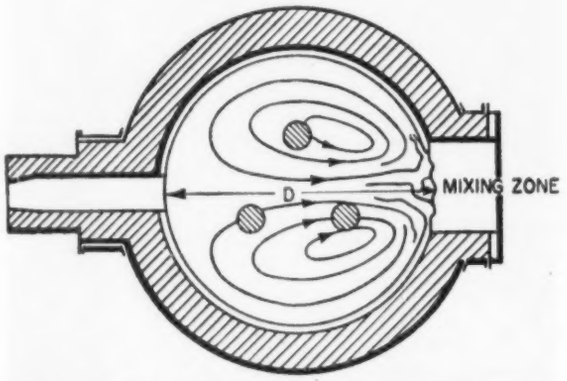
"Benefits obtained . . . supply in a very practical manner a solution to many problems in producing high quality steels . . ."

manded that molten metal control should be improved. The Inductive Stirrer appeared to be a practical device in helping to solve some of the more pertinent problems associated with electric furnace operations.

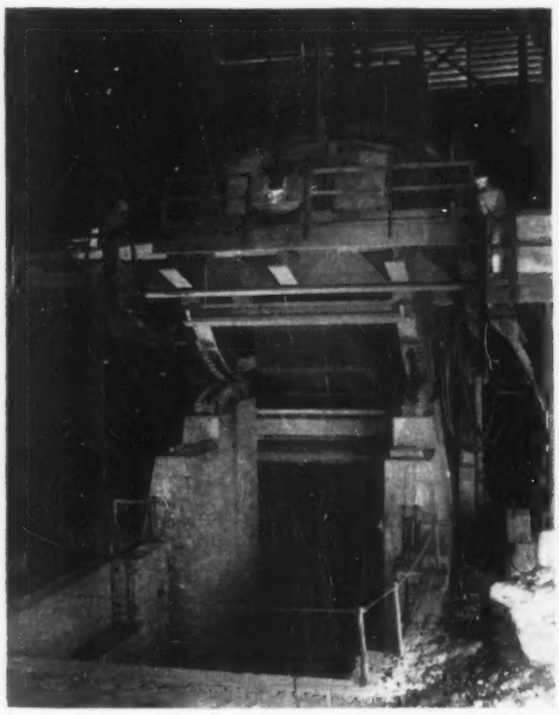
The furnace shell and hearth of the Timken furnace are designed to provide maximum safety to the stirrer and equipment. The danger of a break-through of hot metal which always exists could, of course, be costly. However, steps have been taken to preclude such a contingency.

The first few weeks of operations were particularly gratifying. However, an extended campaign will be necessary to properly evaluate all the economic aspects of inductive stirring. Some highly important trends indicate a definite improvement in steel quality which can be attributed to the device, see Table II.

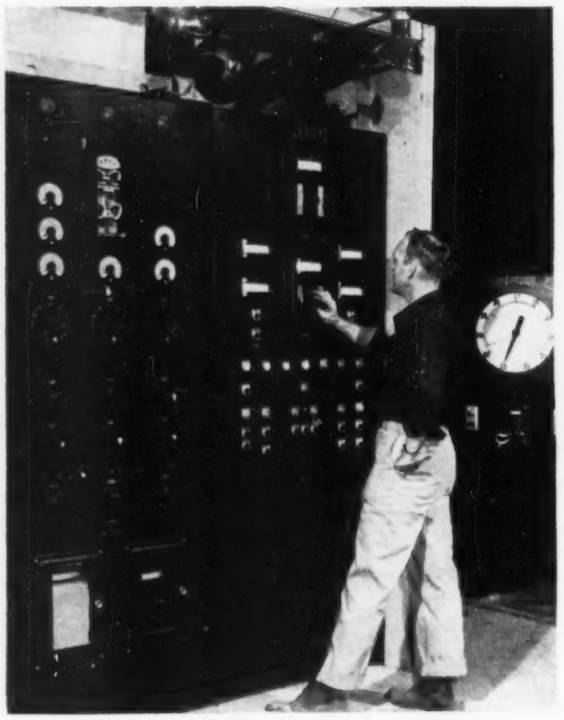
The benefits obtained with the stirrer at Timken substantiate many claims made by Swedish operators and supply in a very practical manner a solution in large measure to many of the problems existing in producing high quality alloy steels in large as well as in small arc furnaces.



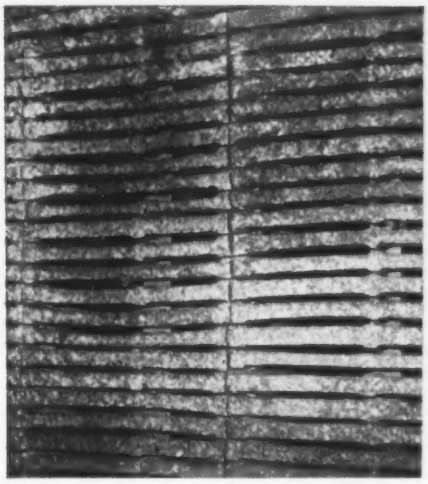
HORIZONTAL MELT FLOW pattern produced by the inductive stirrer can be reversed if desired.



INDUCTIVE STIRRER under bottom plate measures 12 ft 6 in. long, 7 ft 10 in. wide and 27 in. thick. The stirrer is suspended 2 in. from bottom plate of furnace. This furnace tilts forward, 40° in 85 sec, backward tilt is accomplished 15° in 31.7 sec.

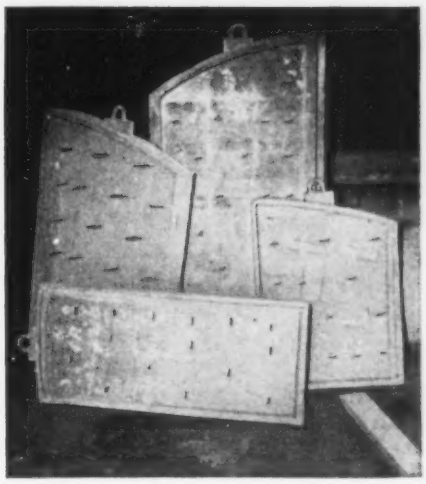


OPERATOR adjusting controls for electro-magnetic inductive stirrer. Control panel at left operates the electric furnace while large dial at right is indicator for the immersion thermocouple. The furnace transformer has a 20,000 KVA capacity with a primary voltage of 23,400 v.



COMPARISON OF GRATE MATERIAL

Gray iron sintering grates, at left, show bad scaling and warpage after a single month of use. Note good shape of Ductile Iron grates, above, after same service. They greatly outlasted gray iron grates.



DUCTILE IRON FURNACE DOORS SAVE MONEY, TIME AND LABOR—In ordinary iron, exposed to high temperature, internal oxidation easily penetrates along paths of flake graphite, thus causing destructive growth. Penetration is curbed in Ductile Iron, since its graphite is wholly in spheroidal form.

DUCTILE IRON Sintering Grates and Furnace Doors

excel in elevated temperatures

Performance Records Show Outstanding Heat-Resistance of this New Material.

Tests show that iron containing graphite wholly in spheroidal form provides notably greater growth resistance than ordinary gray iron.

FOR INSTANCE: Gray iron and Ductile Iron grate bars in the Greenawalt sintering system of a merchant pig-iron producer gave the following performances:

At the Canadian Furnace Company, Ltd., in Port Colborne, Ontario . . . from date of their installation, August 1950, to June 1951 . . . no Ductile Iron grates needed replacements although 150 gray iron grates had to be replaced after 6 weeks' service.

The sinter-plant foreman stated, "*The Ductile Iron grates still seem to be as good as new.*" Cast by Lakeside Foundry, Ltd., of Port Colborne, these Ductile Iron grates also out-performed steel grates tested previously.

ANOTHER EXAMPLE: The forging furnaces of a leading steel plant now have Ductile Iron doors supplied by United Engineering and Foundry Company, Pittsburgh 22, Pa. Gray cast iron doors which were subjected to 24 hours' continuous service daily, heat-cracked after an average life of about four weeks. A trial lot of annealed Ductile Iron doors lasted 17 weeks . . . or more than four times as long as those of gray cast iron.

APPLICATIONS: As cast, as well as heat-treated Ductile Iron parts . . . serving at elevated temperatures in scores of machinery, engine and furnace applications . . . provide a growth-resistance heretofore unavailable in gray cast iron.

AVAILABILITY: Send us details of your prospective uses, so that we may offer a list of sources from some 100 authorized foundries now producing Ductile Iron under patent licenses. Request a list of available publications on Ductile Iron . . . mail the coupon now.

INCO

The International Nickel Company, Inc.
Dept. 20, 67 Wall Street, New York 5, N. Y.

Please send me a list of publications on:
DUCTILE IRON

Name_____ Title_____

Company_____

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THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N. Y.

Technical Briefs

Engineering

HEAT TREATING:

Residual stresses in jet engine parts "relaxed" at Ryan.

Four large, new furnaces, each different in design, have been installed recently at Ryan Aeronautical Co., San Diego, Calif., to "put the heat on" jet engine components. Including a towering second story model with an elevator bottom and a 52-ft long tunnel type, these unusual furnaces point up the importance of heat treatment in a modern aircraft production program.

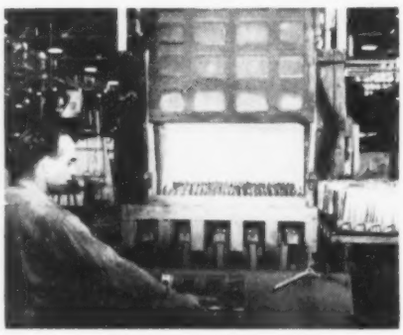
The new facilities will be used to stress relieve afterburners, rocket motors, aft frames and other jet engine components.

Locked Up—Residual stresses are caused by welding and forming processes.

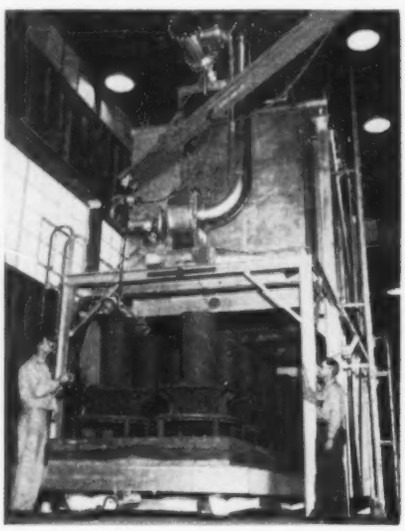
Jet parts are subjected to high temperatures and stresses in use and stress relief is a "must" in their manufacture. Also, the extremely exacting dimensions to which jet engine parts are designed have intensified the need for closely controlled stress relief.

Causes—Residual stresses are strains existing in metals while they are free from external loads. They are caused by differential plastic flow which can result from rapid and uneven cooling of hot metal, forming, cold-working, machining and other processes which produce working or loading of the metal.

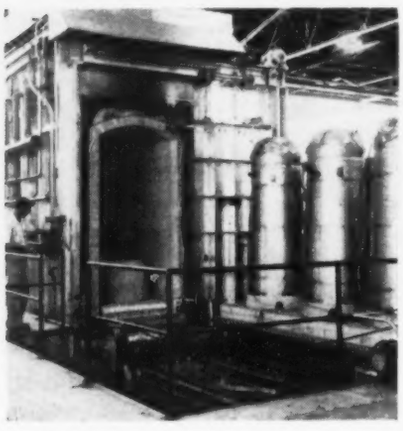
No satisfactory method for determining the magnitudes and distributions of residual stresses, by nondestructive means, has been



STAINLESS STEEL jet engine struts are loaded into Knapp furnace at Ryan. Homemade loading system is hydraulically actuated.



AFT FRAMES for jet engines are rolled out of huge GE electric furnace. Furnace is completely automatic and atmosphere is closely controlled.



SLIDING DOOR of Industrial Systems furnace was specially designed to meet requirements for heat treating afterburners.

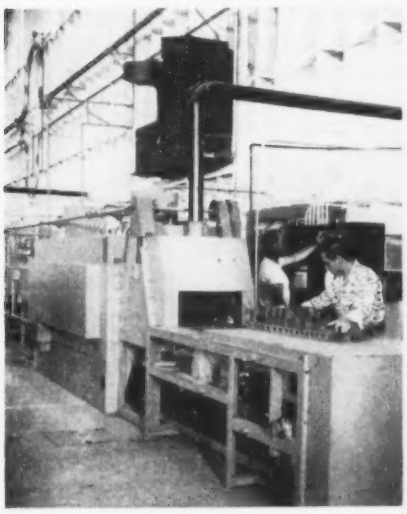
IF YOU WANT MORE DATA

You may secure additional information on any item briefed in this section by using the reply card on page 49. Just indicate the subject heading and the page on which it appears. Be sure to note exactly the information wanted.

devised. Therefore, it is essential that they be removed from structures which are destined to carry critical loads in service.

Plastic Flow — Metal components which are not stress relieved in production will tend to stress relieve themselves at high service temperatures because the heat encourages plastic flow in the direction in which the residual stresses are acting.

Realignment of the crystals would produce a distortion of all of the fine tolerances in the structure and throw bearing surfaces and other critical points out of alignment.



ROCKET MOTORS are "relaxed" in 52-ft continuous Lindberg furnace. Endless chain conveyer belt feeds parts to furnace.

Adjustment — To relieve residual stresses, the structure must be relatively free to adjust itself under the force of their action. This can be accomplished either by imposing additional loading, mechanically, or by reducing the yield strength of the material, thermally.

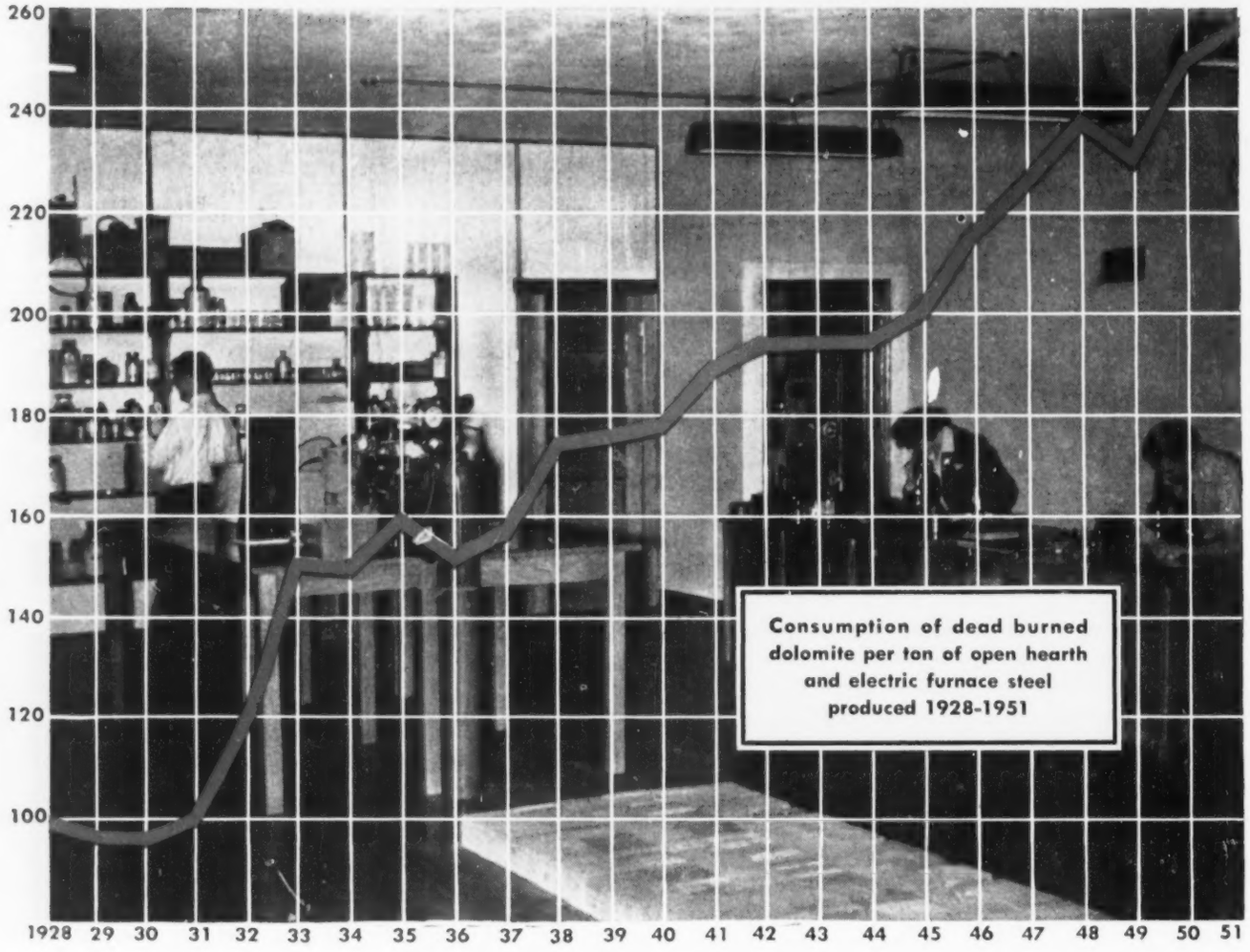
At Ryan, the latter method is employed because it permits a prescribed treatment which can be calculated for each alloy and condition of service. As metals are heated, their residual stresses are relieved and they become more and more "relaxed."

DRY ICE:

Conversion of waste CO_2 to refrigerant suggested.

Dry ice, as a method to utilize waste carbon dioxide gas may be worth investigating, H. A. Sommers, assistant chief engineer, Westvaco Chemical Div. of Food Machinery & Chemical Corp., recently told the 45th annual meeting of American Institute of Chemical Engineers.

A consent judgment recently signed in federal court breaking up an alleged monopoly held by five major companies opened the way for companies having waste carbon dioxide gas to use it in making liquid and solid carbon dioxide, Mr. Sommers said.



quality standards in dead burned dolomite

WHEN introduced as a substitute for Austrian magnesite during World War I, dead burned dolomite usually contained excessive and uncontrolled amounts of silica, alumina and iron oxide. It left much to be desired as a refractory. To determine standards for an ideal refractory and to correct weaknesses in this pioneer product, Basic Refractories in 1922 established a research and development program.

Investigations established the reactions that refractories undergo in contact with basic open hearth slags. These findings, supported by studies of the thermochemical reactions involved in making dead burned dolomite, made it possible to set definite standards of quality, leading to continuous product improvement.

Today, the most dependable dead burned dolomites provide a maximum of the refractory oxides, crystalline lime (CaO) and periclase (MgO), with just enough calcium ferrites and silicates to provide rapid setting in the furnace hearth. The crystalline lime component performs an important function in resisting siliceous slags formed in the early stages of a heat, while the periclase component has excellent resistance to the corrosive action of the basic slag formed later.

Manufactured to standards designed to satisfy actual conditions inside the furnace, dead burned dolomite has become America's preferred maintenance refractory—dependable in performance, low in cost, and plentiful in supply. Magnefer and Syndolag, trade names synonymous with quality in dead burned dolomite, can bring these benefits to every open hearth and electric steel producer. They are available in increased tonnages due to completion of our third major plant expansion in ten years.

Basic Refractories Incorporated

845 HANNA BUILDING, CLEVELAND 15, OHIO

Exclusive Agents in Canada: REFRACTORIES ENGINEERING AND SUPPLIES, LTD., Hamilton and Montreal

Mills Pay Double Time As Consumer Pressure Grows

Ingot rate falls only 5½ points in holiday week . . . Wave of buying enthusiasm raises market temperature . . . Raw materials are available for extended production drive.

A new wave of buying enthusiasm has lifted the steel market near the boiling point. There is little doubt that business optimism is higher than it has been for several months. This can be seen in the year-end statements of industry executives. And it is literally evidenced by the buying efforts of their purchasing agents.

Some of this optimism may have been held in check by election uncertainties, which have now melted away causing a rush of new business. Probably an even stronger factor is the seeming certainty that controls (on prices, wages and materials) are on the way out.

Free Market—With more freedom in view, manufacturers of consumer durables are training their big production guns on the lusty consumer market. The outlook is for more production, more competition, and, eventually, saturation. Production speed is an important factor in the race for this market.

Spurred by renewed pressure from their customers, steel producers are bending every effort toward keeping production at high levels. Despite Christmas holidays, there will be only a moderate decline in the ingot rate this week. Most major producers will pay double-time wages to keep coke ovens, blast furnaces, openhearth furnaces, and principal rolling mills operating through Christmas. Many shipping departments and some finishing mills will be shut down for the holiday.

Maybe the Last—Second quarter allocations revealed by National Production Authority last week may be the last that agency will make under the present Controlled Materials Plan. It is likely that a number of steel items will be "open-ended" by that time. This would permit mills to sell to whomever they wished after CMP tickets had been taken care of.

Second quarter military requirements are down 10 pct from first quarter. This is further indication that mills are now pretty well current on military deliveries, and that inventories of military items are nearing desired levels.

Doing Better—Freight car builders will get enough steel in second quarter to build 27,000 cars, raising them to a 9000-car-per-month pace. Increased highway allocations, plus full use of self-certification rules, should permit highway building to spring to its highest level in history.

After steadfastly insisting that there would be no substantial supplementary allocations for first quarter, Defense Production Administration officials "found" over half a million (550,000) tons of sheet and strip. Lion's share of this windfall (353,000 tons) was alloted to the automotive industry. Though lacking tickets, auto people had already queued up at the mills for March rolling space. Some 100,000 tons of the supplemental allocations were earmarked for consumer durables and 40,000 tons for building.

Product Rundown—Heavy plates and structurals, large sized bars, and nickel stainless steels still get top billing as the tightest items in the market. But oil country goods and sheets aren't far behind. Merchant wire products, chrome stainless, wire rope, and tool steels are about the only items that can be rated in fair to ample supply. Altogether they do not account for a very large proportion of total production. The heavyweight items are still in very tight supply.

The outlook for steelmaking raw materials is better than at any time since Korea. Despite greatly expanded capacity of the industry, there should be no major production losses for lack of materials.

Improvement — Iron ore shippers, having struggled desperately to make up shipment losses from last summer's strike, confidently expect to move 106 million gross tons of iron ore in 1953. There is enough ore on hand to keep blast furnaces going until shipping is resumed next spring.

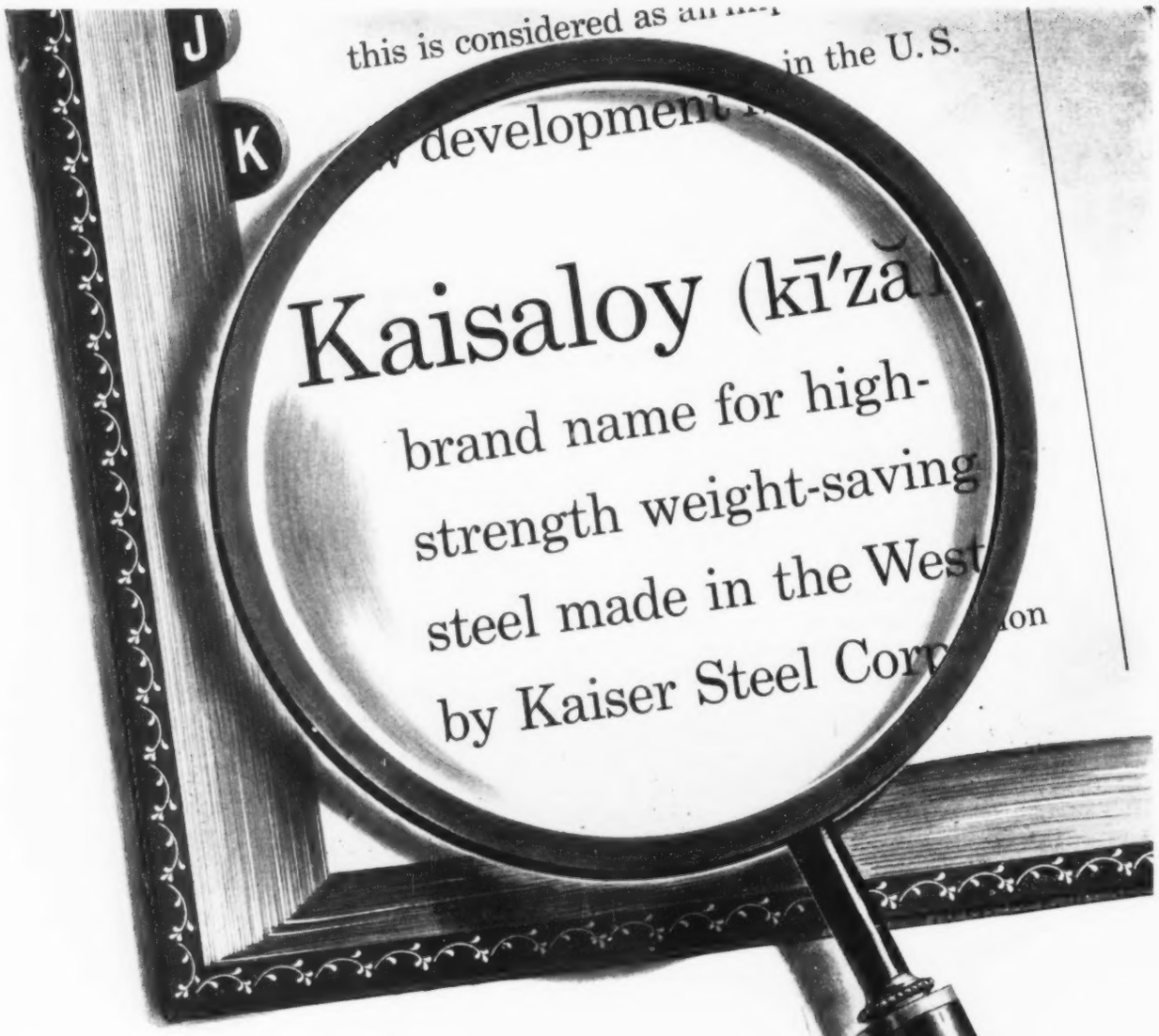
Scrap stocks are bulging. Mills are refusing to pay long freight hauls, and are again choosy on quality. Collection so far has been aided by mild weather. No shortage is expected, although allocation and scrap-drive organizations are being kept intact.

Allocation of tungsten by International Materials Conference is being abandoned because of improving supply. Free-world production has increased 50 pct in the past year and a half.

Supplies of manganese, though by no means comfortable, are adequate for current needs. The same is true of fluorspar. Nickel and molybdenum are still in short supply, especially the former.

Efforts to increase production of most of these steelmaking materials will continue, as supplies are still not adequate to support both high production by industry and heavy U. S. stockpiling.

Down a Little—Steelmaking operations this week are scheduled at 100.5 pct of rated capacity, down 5½ points from last week.



Good word for the West

An increasingly important word in the language of western manufacturers is *Kaisaloy*—a high-strength, weight-saving steel with advantages for many structures and products.

Outstanding among these advantages is the ability of *Kaisaloy* to provide greater load capacity with no corresponding increase in weight. It has good ductility, resists abrasion and deformation, is workable and easy to weld.

Because of *Kaisaloy's* versatility it meets rigid specifications for such diverse applications as auto bumpers, oil derricks, trucks, tractors, bridges, streetlight poles.

The production of *Kaisaloy* by Kaiser Steel assures a nearby, dependable source for Western industry. It's another example of how Kaiser Steel continues to expand its diversified line of steel products to meet the growing needs of the West.

It's good business to do business with

Kaiser Steel

built to serve the West

PROMPT, DEPENDABLE DELIVERY AT COMPETITIVE PRICES • plates • continuous weld pipe • electric weld pipe • tin plate • hot rolled strip • hot rolled sheet alloy bars • carbon bars • structural shapes • cold rolled strip • special bar sections • semi-finished steels • pig iron • coke oven by-products
For details and specifications, write: **KAISER STEEL CORPORATION, LOS ANGELES, OAKLAND, SEATTLE, PORTLAND, HOUSTON, TULSA, NEW YORK**

Market Briefs and Bulletins

Price Increases—U. S. Steel Export Co. has raised prices on carbon steel nails and staples. Nails are now listed at $6.96 per lb; staples at $6.91 per lb. National Carbon Co. has also raised its prices on graphite electrodes, effective Jan. 1.

Controls Off—Price controls have been lifted from royalty payments to owners of iron ore lands. Office of Price Stabilization believes fees for royalties on mining iron ore do not affect the price of ore since such payments are usually transfers of cost between different divisions of a mining company.

More Bounce—Cleveland Port & Harbor Commission is studying a "rubber road" which B. F. Goodrich officials believe will "open up a new era of expansion in the Cuyahoga Valley. Estimated cost of the rubber conveyer, which would transport iron ore and limestone to industrial plants, is $6 million. Proponents of the beltline say it could handle 5,000 tons per hr.

Ready to Fight—Cadillac's Cleveland tank plant is reported getting ready to turn out light tanks that will be immediately ready for combat. Walker Bulldog tanks were formerly shipped to government ordnance depots where radios, machine guns and other combat equipment was added. This production change is expected to reduce loading and handling costs considerably.

More Diesels—Pennsylvania RR recently completed a $311,791,000 diesel locomotive expansion program. Delivery of the last locomotive this month brought Pennsylvania's diesel fleet to 315, the largest in the country.

Jet Contract Hiked—An additional $20 million has been added to Ford Motor Co.'s Air Force jet engine contract. This raises to $97 million the value of jet engine orders at Ford's Aircraft Engine Div. in Chicago. Fifty pct of the tools to be used in the jet engines will be purchased as new. Total of Ford and government expenditures on new machine tools by the time jet engine production flow begins will be $50 million.

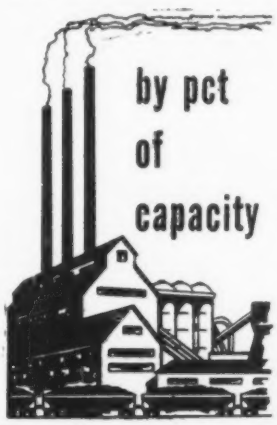
Alcoa Contract—F. H. McGraw & Co. has been awarded a contract by Aluminum Co. of America to erect a 13,200-ton horizontal extrusion press at Alcoa's Lafayette, Ind., plant. The new press, which was built in Germany, is being installed as part of the Air Force's heavy press program. Work has been started, and first tests are expected by June, 1953.

Tinplate Mill—British Iron & Steel Corp. has approved application of Steel Co. of Wales to spend $112 million on erection of five-stand cold reduction mill. Machinery for the plant is expected to come from Pittsburgh manufacturers.

Refinery Expansion—A 32 pct increase in second quarter steel allocations for Petroleum Administration for Defense will enable the agency to carry on its program to expand refining capacity. Current goal is to increase present capacity 1 million bbl per day by Jan. 1, 1955.

Cheaper Homes—Gunnison Homes, Inc. will reduce prices on its 1953 Champion home model. The decrease will push prices as low as $6,500, not including lot. Production of the new homes was started last week.

STEEL OPERATIONS

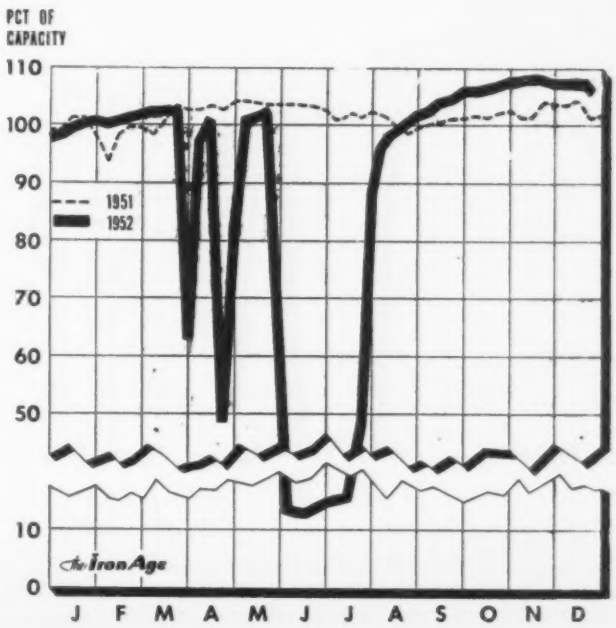


District Operating Rates

District	Week of Dec. 21	Week of Dec. 14
Pittsburgh	102.0	106.0
Chicago	104.0	109.0
Valley	100.0	105.0
Philadelphia	100.0	102.0
West	101.0	107.0
Buffalo	103.0	106.5
Cleveland	87.0	108.0
Detroit	99.0	106.0
Wheeling	101.0	101.0
Birmingham (South)	107.5	109.0
South Ohio River	73.0	93.0
St. Louis	96.0	96.0
East	92.0	92.0
Aggregate	100.5	106.0

Beginning Jan. 1, 1953, operations are based on annual capacity of 108,587,670 net tons.

* Revised



ODM Proposes New Aluminum Hike

Mobilizers advocate ½¢ boost for pig, ingot aluminum and 4 pct for finished forms . . . May drop international copper allocation . . . To reopen antimony smelter—*By R. L. Hatschek.*

The aluminum industry may get some price relief before expected. Office of Defense Mobilization has made a recommendation that pig and ingot prices be allowed another ½¢ increase with a 4 pct hike in finished metal and fabricated products. Added to the increase earlier this year, it would bring the total boost to 1½¢ on primary pig and ingot and 9.2 pct on finished and fabricated aluminum.

If permitted, this would give the primary producers almost what they asked last summer. The request at the time was 2¢ and 10 to 12 pct and was based on cost studies showing increases between 1939 and 1952 of 61 pct on raw materials, 150 pct on wages and fringe benefits (not including the boost this year), and 80 pct on freight. In view of the industry's remarkable price record, some adjustment would seem only fair despite cost decreases resulting from technological advances and greater quantity production.

ODM Thinks So—The ODM recommendation of the price stabilizers is reportedly founded on three points: (1) Industry earnings standards, (2) the regulation issued to prevent price from slowing production of vital defense materials, General Overriding Regulation 29, and (3) a desire to modify the government's contracts with aluminum producers. The General Services Administration agreement for aluminum from newly built facilities enables producers to escape the contract if a reasonable profit cannot be realized. GSA can end contracts as soon as half the tonnage involved has been delivered.

Allotments—Copper and aluminum rations for the second quarter will be the same as present quotas, 50 pct and 55 pct of base period use respectively. Requirements of both metals were estimated at 40 pct greater than supply by the Defense Production Administration. Military requirements of copper, the agency said, will continue high through the second and third quarters while drought-caused losses of aluminum production were cited as the reason for continuation of aluminum ration quantities.

Meanwhile, International Materials Conference may discontinue copper allocation after January. The agency is recommending distribution of 723,080 metric tons of the metal for the first quarter and will later review the supply-demand picture to determine if allocation should be ended. U. S. share of primary copper, blister and refined, for the quarter will be 350,000 tons.

No Pass Through—There will no passing along of increased costs due to the recent increase in rolled nickel, Monel and Inconel products from International Nickel Co.'s Huntington mill. Office of Price Stabilization had permitted a 2½¢ boost on Dec. 16. The agency reminds other producers, manufacturers and processors they may apply for ceiling adjustments under various OPS procedures.

OPS also said last week that brass and copper wire mills need not recalculate ceilings before Apr. 1. This, of course, results from the firmness of the Chilean price of 36½¢ per lb.

Lead Picture—Supply of lead during 1952 was estimated at 1,328,000 tons by the Lead Industries Assn. Imports provided the biggest portion, 518,000 tons of pig and lead contained in ores. Domestic mine production tallied up to 375,000 tons and recovery of lead from secondary sources was 435,000 tons.

But consumption during the year only reached 1,150,000 tons. Of the 178,000 tons not accounted for, approximately 100,000 tons went into the government's strategic stockpile and the remaining 78,000 tons may be assumed to have gone into industry stocks.

Antimony Smelter—The Bradley Mining Co. has indicated it will reopen its Stibnite, Idaho, antimony smelter during the spring. Before closing last summer, it produced about 90 pct of this country's antimony. It will now be used for custom smelting of foreign ores in order to conserve the deposits at Stibnite which contain more than half the known reserves in the U. S.

Copper Output Dips—November production of refined copper in the U. S., as reported by the Copper Institute, totaled 100,075 tons.

NONFERROUS METAL PRICES

	Dec. 17	Dec. 18	Dec. 19	Dec. 20	Dec. 22	Dec. 23
Copper, electro, Conn.	24.50	24.50	24.50	24.50	24.50	24.50
Copper, Lake delivered	24.625	24.625	24.625	24.625	24.625	24.625
Tin, Straits, New York	$1.21½	$1.21½	$1.21½	....	$1.21½	$1.21½*
Zinc, East St. Louis	12.50	12.50	12.50	12.50	12.50	12.50
Lead, St. Louis	13.80	13.80	13.80	13.80	13.80	13.80

Note: Quotations are going prices.
*Tentative.

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.188 in., 2S, 3S, 31.6¢; 4S, 61S-O, 33.6¢; 52S, 35.8¢; 24S-O, 24S-OAL, 34.5¢; 75S-O, 75S-OAL, 41.9¢; 0.081 in., 2S, 3S, 32.8¢; 4S, 61S-O, 35.2¢; 52S, 37.4¢; 24S-O, 24S-OAL, 35.8¢; 75S-O, 75S-OAL, 43.9¢; 0.032 in., 2S, 3S, 34.6¢; 4S, 61S-O, 39.0¢; 52S, 41.8¢; 24S-O, 24S-OAL, 43.8¢; 75S-O, 75S-OAL, 54.8¢.

Plate ¼ in. and Heavier: 2S-F, 3S-F, 29.7¢; 4S-F, 31.7¢; 53S-F, 33.4¢; 61S-O, 32.3¢; 24S-O, 24S-OAL, 34.0¢; 75S-O, 75S-OAL, 40.7¢.

Extruded Solid Shapes: Shape factors 1 to 5, 35.5¢ to 77.2¢; 12 to 14, 36.2¢ to 93.5¢; 24 to 26, 38.7¢ to $1.22; 36 to 38, 45.9¢ to $1.79.

Rod, Rolled: 1.064 to 4.5 in., 2S-F, 3S-F, 39.4¢ to 35.2¢; cold-finished, 0.375 to 3 in., 2S-F, 3S-F, 42.5¢ to 36.8¢.

Screw Machine Stock: Rounds, 11S-Ts, ⅛ to 11/32 in., 56.2¢ to 44.1¢; ⅜ to 1½ in., 43.6¢ to 41.0¢; 1 9/16 to 3 in., 40.4¢ to 37.8¢; 17S-Ts, 1.6¢ per lb lower. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in., 2S, 41.5¢ to 30.5¢; 52S, 50.4¢ to 36.8¢; 56S, 53.6¢ to 44.1¢; 17S-T4, 56.7¢ to 39.4¢; 61S-T4, 50.9¢ to 38.9¢.

Extruded Tubing: Rounds, 63S-T5, OD in in.: 1¼ to 2, 38.9¢ to 56.7¢; 2 to 4, 35.2¢ to 47.8¢; 4 to 6, 35.7¢ to 43.6¢; 6 to 9, 36.2¢ to 45.7¢.

Roofing Sheet: Flat, 0.019 in. x 28 in., per sheet, 72 in., $1.199; 96 in., $1.598; 120 in., $1.997; 144 in., $2.398. 0.24 in. x 28 in., 72 in., $1.448; 96 in., $1.931; 120 in., $2.414; 144 in., $2.897. Coiled sheet: 0.019 in. x 28 in., 29.6¢ per lb; 0.024 in. x 28 in., 28.2¢ per lb.

Magnesium

(F.O.B. mill, freight allowed)

Sheet and Plate: FS1-O, ¼ in., 63¢; 3/16 in., 65¢; ⅛ in., 67¢; B & S Gage 10, 68¢; 12, 72¢. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam in., ¼ to 0.311 in., 74¢; ½ to ¾ in., 57.5¢; 1¼ to 1.749 in., 53¢; 2½ to 5 in., 48.5¢. Other alloys higher. Base up to ¾ in. diam, 10,000 lb; ¾ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M. In weight per ft, for perimeters less than size indicated, 0.10 to 0.11 lb, 3.5 in., 62.3¢; 0.22 to 0.25 lb, 5.9 in., 59.3¢; 0.50 to 0.59 lb, 8.6 in., 56.7¢; 1.8 to 2.59 lb, 19.5 in., 53.8¢; 4 to 6 lb, 28 in., 49¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ to 1.80 lb, 20,000 lb; 1.80 and heavier, 30,000 lb.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057; ¼ in. to 5/16, $1.40; 5/16 to ⅜, $1.26; ½ to ⅝, 93¢; 1 to 2 in., 76¢; 0.165 to 0.219, ⅝ to ¾, 61¢; 1 to 2 in., 57¢; 3 to 4 in., 56¢. Other alloys higher. Base, OD in in.: Up to 1½ in., 10,000 lb; 1½ in. to 3 in., 20,000 lb; 3 in. and larger, 30,000.

Titanium

(100,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheets and strip, HR or CR, $15; Plate, HR, $12; Wire, rolled and/or drawn, $10; Bar, HR or forged, $6; Forgings, $6.

Nickel and Monel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel
Sheets, cold-rolled	79½	63
Strip, cold-rolled	85½	66
Rods and bars	75½	61
Angles, hot-rolled	75½	61
Plates	77½	62
Seamless tubes	108½	96
Shot and blocks		54½

Copper, Brass, Bronze

(Freight prepaid on 200 lb)

	Sheet	Rods	Extruded Shapes
Copper	45.52	....	45.12
Copper, h-r	....	41.37	....
Copper, drawn	....	42.62	....
Low brass	42.34	42.03	....
Yellow brass	40.17	39.86	....
Red brass	43.10	42.79	....
Naval brass	44.72	38.78	40.04
Leaded brass	....	....	38.02
Com'l bronze	44.39	44.08	....
Mang. bronze	48.44	42.83	43.89
Phos. bronze	64.72	64.97	....
Muntz metal	42.69	38.25	39.50
Ni silver, 10 pct	51.96	54.18	....

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb. freight allowed	20.00
Aluminum pig	19.00
Antimony, American, Laredo, Tex.	34.50
Beryllium copper, 3.75-4.25% Be	$1.595
Beryllium aluminum 5% Be, Dollars per lb contained Be	$69.00
Bismuth, ton lots	$2.25
Cadmium, del'd	$1.75 to $2.00
Cobalt, 97-99% (per lb)	$2.40 to $2.47
Copper, electro, Conn. Valley	24.50
Copper, Lake, delivered	24.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$2.00
Lead, St. Louis	13.80
Lead, New York	14.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb.	24.50
Magnesium, sticks, 100 to 500 lb.	42.00 to 44.00
Mercury, dollars per 76-lb. flask, f.o.b. New York	$212 to $214
Nickel electro, f.o.b. N. Y. warehouse	59.58
Nickel oxide sinter, at Copper Creek, Ont., contained nickel	52.75
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$90 to $93
Silver, New York, cents per oz.	83.25
Tin, New York	$1.21½
Titanium, sponge	$5.00
Zinc, East St. Louis	12.50
Zinc, New York	13.88
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb, delivered carloads)

85-5-5-5 ingot	
No. 115	27.25
No. 120	26.75
No. 123	26.25
80-10-10 ingot	
No. 305	33.00
No. 315	30.50
88-10-2 ingot	
No. 210	41.50
No. 215	40.00
No. 245	34.50
Yellow ingot	
No. 405	23.25
Manganese bronze	
No. 421	30.50

Aluminum Ingot

(Cents per lb, 100,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper, max.	20.6
0.60 copper, max.	20.4
Piston alloys (No. 122 type)	20.5
No. 12 alum. (No. 2 grade)	19.5
108 alloy	20.6
195 alloy	20.8
13 alloy (0.60 copper max.)	20.8
ASX-679	20.5

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½%	18.80
Grade 2—92-95%	18.60
Grade 3—90-92%	18.40
Grade 4—85-90%	18.20

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	37.34
Electrodeposited	33¾
Flat rolled	38.34
Forged ball anodes	43
Brass, 80-20	
Cast, oval, 15 in. or longer	34¾
Zinc, oval	26½
Ball, anodes	25½
Nickel, 99 pct plus	
Cast	76.00
Rolled, depolarized	77.00
Cadmium	$2.15
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	97½

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	63
Copper sulfate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed	27½
Nickel chloride, 375 lb drum	27½
Silver cyanide, 100 oz lots, per oz	67¼
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drum	47.7

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add ½¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	21½	20¾
Yellow brass	19⅛	17⅞
Red brass	20¼	19⅜
Comm. bronze	20½	19¾
Mang. bronze	18½	17¾
Brass rod ends	18⅞	....

Custom Smelters' Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
Refinery brass	17.25*
Radiators	14.75

* Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
No. 1 composition	18.50
No. 1 comp. turnings	18.25
Rolled brass	15.50
Brass pipe	16.50
Radiators	14.75
Aluminum	
Mixed old cast	9 — 9¾
Mixed new clips	10 — 11
Mixed turnings, dry	9 — 9½
Pots and pans	8½ — 9

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	18¾ — 19¼
No. 2 heavy copper and wire	17 — 17½
Light copper	15½ — 16
New type shell cuttings	15½ — 16
Auto radiators (unsweated)	14
No. 1 composition	17½ — 18
No. 1 composition turnings	17 — 17½
Unlined red car boxes	16½ — 17
Cocks and faucets	15 — 15½
Mixed heavy yellow brass	11½ — 12
Old rolled brass	14½ — 15
Brass pipe	15½ — 16
New soft brass clippings	16 — 16½
Brass rod ends	15½ — 16
No. 1 brass rod turnings	15 — 15½

Aluminum

Alum. pistons and struts	6½ — 7
Aluminum crankcases	7½
2S aluminum clippings	10½
Old sheet and utensils	7¼
Borings and turnings	5 — 6
Misc. cast aluminum	7½ — 8
Dural clips (24S)	7½

Zinc

New zinc clippings	7 — 7½
Old zinc	5 — 5½
Zinc routings	3 — 3¼
Old die cast scrap	4 — 4½

Nickel and Monel

Pure nickel clippings	35 — 36
Clean nickel turnings	35 — 36
Nickel anodes	35 — 36
Nickel rod ends	35 — 36
New Monel clippings	28 — 29
Clean Monel turnings	20 — 21
Old sheet Monel	28 — 29
Nickel silver clippings, mixed	13 — 14
Nickel silver turnings, mixed	12 — 13

Lead

Soft scrap, lead	10¾ — 11¼
Battery plates (dry)	5.90 — 6.15
Batteries, acid free	4.15

Magnesium

Segregated solids	15 — 16
Castings	14 — 15

Miscellaneous

Block tin	100
No. 1 pewter	70
No. 1 auto babbitt	55 — 60
Mixed common babbitt	13½ — 14
Solder joints	17¾
Siphon tops	60
Small foundry type	18 — 18½
Monotype	13½ — 14
Lino. and stereotype	12½ — 13
Electrotype	10¾ — 11
Hand picked type shells	8¾ — 9
Lino. and stereo. dross	5
Electro dross	4½

Scrap Man's Convention on Jan. 11

Silver anniversary convention to be held in New York . . . Open forum will focus on fair trade practices and industry problems . . . Equipment exhibit will again be held.

The silver anniversary convention of the Scrap Iron & Steel Institute will be held at the Hotel Commodore, New York City, on Jan. 11 to 13. Special focus will be put on the problems of the industry.

Prepared speeches will be forgotten on Jan. 12 when an open forum will be held. Intention is to freely discuss the question of fair trade practices as pertaining to scrap and other industry problems.

Forum moderators will be: Isaac Bierman, chairman, Yard Dealers committee; Henry T. Luria, chairman, Fair Trade Practices committee; and Max Schlossberg, chairman, Brokers committee. Institute president Ralph E. Ablon will preside.

Of course, the equipment exhibit of manufacturers of scrap yard machinery will be staged. From advance registrations it is indicated that some 2000 scrap men and their families will attend, reports Ed Barringer, Institute executive vice-president.

On Jan. 11 registration will be continued, equipment exhibit will open, and chapter officers will meet at a workshop. On Jan. 12 will be the day of speeches by top men in the industry. The banquet will be held that evening and the attraction will be George Jessel, toastmaster. The final day of the convention is reserved for business meetings and elections.

Scrap was calm across the country this week due to cold weather, the holiday season and generally high inventories. Most of the trade looks for a pick-up after the New Year, but cast will probably not show it for some time.

Electric furnace stocks have improved considerably, even in Detroit, where demand had been extremely high ever since the end of the steel strike. Demand is still strong in most areas, however.

Pittsburgh—Good electrice furnace grades continue in strong demand. Otherwise the market is quiet, with little interest shown by consumers. Neither is there much pressure from brokers and dealers, which is usual at year-end. So long as good weather prevails, the mills are satisfied to balance receipts with consumption in view of current comfortable inventories.

Chicago—Scrap movement appeared little affected by the approaching holidays or cold weather. Activity at the dealer level had fallen as much as 20 pct some brokers believed, largely due to approaching tax time, cold weather. The trend appeared to be seasonal, the general scrap market remaining good for steel making grades. Turnings continued in a split market, with producer turnings apt to command a better price than yard material. Electric furnace was not strong but ceiling sales were being made on a number of small shipments.

Philadelphia—A relatively small order for unstripped motor blocks by a large foundry scrap consumer has had the effect of firming the cast market. The price was $38 delivered. There has been a bit more active demand from consumers of chemical borings in the past few weeks.

New York—The Holiday lull afflicted the scrap market here. Openhearth grades continued to move, however. The trade here believes that the New Year will see revival of activity as mills begin to buy more heavily. Dealers hope that good weather continues so that improved demand can be met with unhampered yard preparation work. The cast market probably will not perk up even with the New Year to any substantial extent, according to trade sources.

Detroit — Electric furnace mills which were precariously short a few weeks ago have built up inventories to a more comfortable situation. Expensive shipments by water from the upper Great Lakes figured prominently in the build-up. Demand for electric grades is still very strong and mills are also taking all openhearth grades. Blast furnace continues strong enough to stay at ceiling. The improving inventory situation is leading to tougher inspection here.

Cleveland—Noticeable shortage of help, aggravated by vacations, is about the only problem facing scrap men here. Mills are doing very little buying. Dealers have no reason to hold on to scrap which is going at ceiling. There are scattered reports of tightness in freight cars but good weather and general inactivity have eliminated any real problems. Electric furnace is the only item in demand.

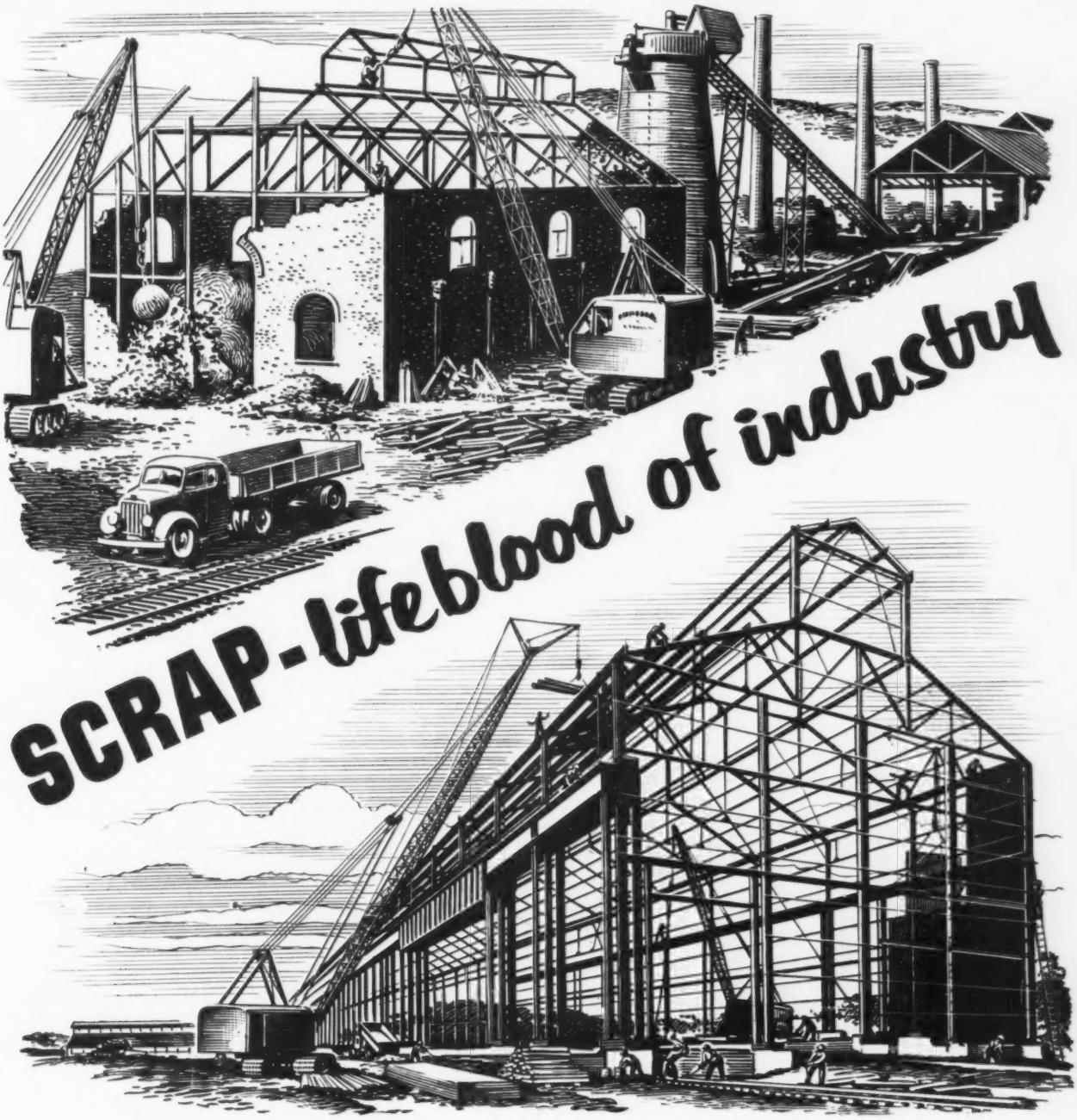
Birmingham—The scrap market in the South seems to have already started its Christmas holiday. Some scrap is moving north to openhearth and blast furnaces, but in limited quantities. The cast market continues almost at a standstill. Some dealers say a little more scrap is coming into their yards in exchange for money for Christmas shopping. Brokers have called their buyers off the road until after the New Year.

St. Louis—While no sizeable orders are being issued by the steel mills, here, they are taking what is offered. But offerings are small. Country yards report that they are receiving very little scrap. The salvage drive seems to have bogged down. Railroad lists are light.

Cincinnati—Restricted buying and "wait until next year" psychology prevail while some scrap men wonder about the possibility of a winter shortage. If orders aren't better spaced and weather turns bad slow collections will hurt. Cast market remains dull as foundry business in the area drags.

Boston—Dealers are expressing confident expectation of a pickup in demand for some grades once the Mystic blast furnace gets back into operation in January after its 6-week lapse. Biggest boost should come in short shovelings and stove plate. Otherwise the market is coasting along as before.

West Coast—Scrap prices are unchanged this week. Usual holiday slackening of demand is noted.



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CHICAGO, ILLINOIS	LOS ANGELES, CAL.	ST. LOUIS, MO.
CLEVELAND, OHIO	NEW YORK, N. Y.	SAN FRANCISCO, CAL.
	SEATTLE, WASH.	

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Iron and Steel SCRAP PRICES

(Maximum basing point prices, per gross ton, as set by OPS in CPR 5 and amendments.)

Switching Charge (Dollars per gross ton) →		$0.99	.76	.53	.85	.75	.51	.75	.51	.75	.70	.76	.83	.66	.26	1.34	.79	.50	.20	.51	.51	.20	.62	.47	.51	.51	.51	.85	.50	.78	.50	.43	.51	.33	.57	.66	.65	.52	.68	.58
Basing Points →		Pittsburgh	Johnstown	Brackenridge	Butler	Midland	Monessen	Sharon	Youngstown	Canton	Steubenville	Warren	Weirton	Cleveland	Buffalo	Cincinnati	Middletown	Chicago	Claymont	Coatesville	Conshohocken	Harrisburg	Phoenixville	Sparrows Pt.	Bethlehem	Ashland, Ky.	Kokomo, Ind.	Portsmouth, O.	St. Louis	Detroit	Duluth	Kansas City	Birmingham	Alabama City	Atlanta	Minneapolis	Houston	Los Angeles	Pittsburg, Cal.	Portland, Ore.	San Francisco	Seattle
GRADES	OPS No.																																								
No. 1 bundles	1	$44.00							$44.00					$43.00				$42.50						$42.00				$41.00	$41.15	$40.00	$39.50	$39.00			$38.00	$37.00	$35.00				
No. 1 busheling	2	44.00							44.00					43.00				42.50						42.00				41.00	41.15	40.00	39.50	39.00			38.00	37.00	35.00				
No. 1 heavy melting	3	43.00							43.00					42.00				41.50						41.00				40.00	40.15	39.00	38.50	38.00			37.00	36.00	34.00				
No. 2 heavy melting	4	43.00							43.00					42.00				41.50						41.00				40.00	40.15	39.00	38.50	38.00			37.00	36.00	34.00				
No. 2 bundles	5	43.00							43.00					42.00				41.50						41.00				40.00	40.15	39.00	38.50	38.00			37.00	36.00	34.00				
Machine shop turnings	6	34.00							34.00					33.00				32.50						32.00				31.00	31.15	30.00	29.50	29.00			28.00	27.00	25.00				
Mixed borings and turnings	7	38.00							38.00					37.00				36.50						36.00				35.00	35.15	34.00	33.50	33.00			32.00	31.00	29.00				
Shoveling turnings	8	38.00							38.00					37.00				36.50						36.00				35.00	35.15	34.00	33.50	33.00			32.00	31.00	29.00				
Cast iron borings	10	38.00							38.00					37.00				36.50						36.00				35.00	35.15	34.00	33.50	33.00			32.00	31.00	29.00				
No. 1 chemical borings	26	41.00							41.00					40.00				39.50						39.00				38.00	38.15	37.00	36.50	36.00			35.00	34.00	32.00				
Forge crops	11	51.50							51.50					50.50				50.00						49.50				48.50	48.65	47.50	47.00	48.50			45.50	44.50	42.50				
Bar Crops and plate	12	49.00							49.00					48.00				47.50						47.00				46.00	46.15	45.00	44.50	44.00			43.00	42.00	40.00				
Punchings and plate	14	46.50							46.50					45.50				45.00						44.50				43.50	43.65	42.50	42.00	41.50			40.50	39.50	37.50				
Electric furnace bundles	15	46.00							46.00					45.00				44.50						44.00				43.00	43.15	42.00	41.50	41.00			40.00	39.00	37.00				
Cut struc., plate, 3 ft and less	16	47.00							47.00					46.00				45.50						45.00				44.00	44.15	43.00	42.50	42.00			41.00	40.00	38.00				
Cut struc., plate, 2 ft and less	17	49.00							49.00					48.00				47.50						47.00				46.00	46.15	45.00	44.50	44.00			43.00	42.00	40.00				
Cut. struc., 1 ft and less	18	50.00							50.00					49.00				48.50						48.00				47.00	47.15	46.00	45.50	45.00			44.00	43.00	41.00				
Foundry steel, 2 ft and less	20	44.00							44.00					43.00				42.50						42.00				41.00	41.15	40.00	39.50	39.00			38.00	37.00	35.00				
Foundry steel, 1 ft and less	21	46.00							46.00					45.00				44.50						44.00				43.00	43.15	42.00	41.50	41.00			40.00	39.00	37.00				
Heavy trimmings	24	43.00							43.00					42.00				41.50						41.00				40.00	40.15	39.00	38.50	38.00			37.00	36.00	34.00				
No. 1 RR heavy melting	RR 1	46.00							46.00					45.00				44.50						44.00				43.00	43.15	42.00	41.50	41.00			40.00	39.00	37.00				
Scrap rails, random lengths	RR 14	46.00							46.00					47.00				46.50						46.00				45.00	45.15	44.00	43.50	43.00			42.00	41.00	39.00				
Scrap rails, 3 ft and less	RR 16	51.00							51.00					50.00				49.50						49.00				48.00	48.15	47.00	46.50	46.00			45.00	44.00	42.00				
Scrap rails, 2 ft and less	RR 17	52.00							52.00					51.00				50.50						50.00				49.00	49.15	48.00	47.50	47.00			46.00	45.00	43.00				
Scrap rails, 18 in. and less	RR 18	54.00							54.00					56.00				52.50						52.00				51.00	51.15	50.00	49.50	49.00			48.00	47.00	45.00				
Rerolling rails	RR 15	53.00							53.00					52.00				51.50						51.00				50.00	50.15	49.00	48.50	48.00			47.00	46.00	44.00				
Uncut tires	RR 20	48.00							48.00					47.00				46.50						46.00				45.00	45.15	44.00	43.50	43.00			42.00	41.00	39.00				
Cut tires	RR 21	51.00							51.00					50.00				49.50						49.00				48.00	48.15	47.00	46.50	46.00			45.00	44.00	42.00				
Cut bolsters and side frames	RR 23	49.00							49.00					48.00				47.50						47.00				46.00	46.15	45.00	44.50	44.00			43.00	42.00	40.00				
RR specialties	RR 24, 28, 29	51.00							51.00					50.00				49.50						49.00				48.00	48.15	47.00	46.50	46.00			45.00	44.00	42.00				
Solid steel axles	RR 25	58.00							58.00					57.00				56.50						56.00				55.00	55.15	54.00	53.50	53.00			52.00	51.00	49.00				
No. 3 steel wheels	RR 27	51.00							51.00					50.00				49.50						49.00				48.00	48.15	47.00	46.50	48.00			45.00	44.00	42.00				
Unassorted	RR 35	40.00							40.00					39.00				38.50						38.00				37.00	37.15	36.00	35.50	35.00			34.00	33.00	31.00				

Cast Scrap Ceilings

Prices set by CPR 5, OPS

(F.o.b. all shipping points)

Grades	OPS No.	
Cupola cast	1	$49.00
Charging box cast	2	47.00
Heavy breakable cast	3	45.00
Cast iron brake shoes	5	41.00
Stove plate	6	46.00
Clean auto cast	7	52.00
Unstripped motor blocks	8	43.00
Cast iron carwheels	9	47.00
Malleable	10	55.00
Drop broken mach'y cast	11	52.00

Ceiling price of clean cast iron foundry runout or prepared cupola drops is 75 pct of corresponding grade.

Under Ceiling Scrap Prices

Pittsburgh

Machine shop turnings	$32.00
No. 1 machinery cast	52.00
Heavy breakable cast	45.00
Malleable	55.00

Chicago

Low phos. forge crops	$50.00 to $51.00
Cut struc., plate, 3 ft & less	44.50 to 45.50
Cut struc., plate, 2 ft & less	46.50 to 47.50
Cut struc., plate, 1 ft & less	47.50 to 48.50
Machine shop turnings	30.00 to 31.50
Mixed borings, turnings	34.00 to 35.50
Shoveling turnings	34.00 to 35.50
Cast iron borings	34.00 to 35.50
Cupola cast	43.00 to 44.00
Heavy breakable cast	38.50 to 40.00
Malleable	47.00 to 48.00
Stove plate	40.00 to 41.00
Clean auto cast	44.00 to 45.00
Charging box cast	41.00 to 42.00
Drop broken mach'y	46.00 to 47.00
Unstripped motor blocks	35.00 to 37.00
Cast iron brake shoes	40.00 to 41.00

Philadelphia Area

Clean cast chem. borings	$37.00 to $38.00
Cupola cast	44.00 to 45.00
Unstripped motor blocks	35.00 to 38.00
Charging box cast	45.00 to 46.00

Cleveland

Cast iron borings	$34.00 to $34.50
Stove plate	45.00 to 46.00
Malleable	51.00 to 52.00

Youngstown

Cast iron borings	$35.00 to $35.50

Buffalo

No. 1 machinery cast	$49.00 to $50.00
No. 1 cupola cast	46.00 to 47.00

Birmingham

Shoveling turnings	$30.00 to $32.00
Cast iron borings	30.00 to 32.00
No. 1 Cupola cast	46.00 to 47.00
Stove plate	41.50 to 42.50
Charging box cast	36.00 to 38.00
Heavy breakable	36.00 to 38.00
Unstripped motor blocks	39.00 to 40.00

New York

Brokers' Buying prices per gross ton, on cars:

Clean cast chem. borings	$29.00 to $30.00
No. 1 machinery cast	47.00 to 49.00
Mixed yard cast	39.00 to 40.00
Charging box cast	44.00 to 45.00
Heavy breakable cast	44.00 to 45.00
Unstripped motor blocks	31.00 to 32.00

Boston

Brokers' Buying prices per gross ton, on cars:

Clean cast chem. borings	$30.00 to $31.00
Mixed cupola cast	35.00 to 37.00
Heavy breakable cast	39.00 to 40.00
Stove plate	36.00 to 37.00
Unstripped motor blocks	30.00 to 30.25

Detroit

Brokers' Buying prices per gross ton, on cars:

No. 1 cupola cast	$48.00
Heavy breakable cast	$43.00 to 44.00
Stove plate	43.00 to 44.00
Cast iron brake shoes	39.00 to 40.00

Cincinnati

No. 1 cupola cast	$49.00
Stove plate	46.00
Drop broken cast	$51.00 to 52.00
Malleable	49.00 to 50.00

St. Louis

Charging box cast	$43.00 to $44.00
No. 1 cupola cast	48.00 to 49.00
Heavy breakable cast	41.00 to 42.00
Unstripped motor blocks	38.00

San Francisco

No. 2 heavy melting	$29.00
No. 2 bundles	29.00
Machine shop turnings	14.00
No. 1 cupola cast	42.00

Los Angeles

No. 2 heavy melting	$29.00
No. 2 bundles	29.00
Machine shop turnings	14.00
Shoveling turnings	20.00
No. 1 cupola cast	44.00

Seattle

No. 2 bundles	$29.00
No. 1 cupola cast	42.50
Mixed yard cast	41.00

Hamilton, Ont.

No. 1 hvy. melting	$35.50
No. 1 bundles	35.50
No. 2 bundles	35.00
Mechanical bundles	33.50
Mixed steel scrap	31.50
Mixed borings, turnings	32.50
Rails, remelting	35.50
Rails, rerolling	44.50
Bushelings	30.50
Bush, new fact, prep'd	33.50
Bush, new fact, unprep'd	32.50
Short steel turnings	32.50
Cast scrap	50.00

Comparison of Prices

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	Dec. 23 1952	Dec. 16 1952	Nov. 25 1952	Dec. 25 1951
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	3.775¢	3.775¢	3.775¢	3.60¢
Cold-rolled sheets	4.575	4.575	4.575	4.35
Galvanized sheets (10 ga)	5.075	5.075	5.075	4.80
Hot-rolled strip	3.725	3.725	3.725	3.50
Cold-rolled strip	5.20	5.20	5.20	4.75
Plate	3.90	3.90	3.90	3.70
Plates wrought iron	9.00	9.00	9.00	7.85
Strains C-R strip (No. 302)	36.75†	36.75†	36.75†	36.75
Tin and Ternplate: (per base box)				
Tinplate (1.50 lb.) cokes	$8.95	$8.95	$8.95	$8.70
Tinplate, electro (0.50 lb.)	7.65	7.65	7.65	7.40
Special coated mfg. ternes	7.75	7.75	7.75	7.50
Bars and shapes: (per pound)				
Merchant bars	3.95¢	3.95¢	3.95¢	3.70¢
Cold finished bars	4.925	4.925	4.925	4.55
Alloy bars	4.675	4.675	4.675	4.30
Structural shapes	3.85	3.85	3.85	3.65
Stainless bars (No. 302)	$1.50†	$1.50†	$1.50†	31.50
Wrought iron bars	10.05	10.05	10.05	9.50
Wire: (per pound)				
Bright wire	5.225¢	5.225¢	5.225¢	4.85¢
Rails: (per 100 lb)				
Heavy rails	$3.775	$3.775	$3.775	$3.60
Light rails	4.25	4.25	4.25	4.00
Semifinished Steel: (per net ton)				
Rerolling billets	$59.00	$59.00	$59.00	$56.00
Slabs, rerolling	59.00	59.00	59.00	56.00
Forging billets	70.50	70.50	70.50	66.00
Alloy blooms, billets, slabs	76.00	76.00	76.00	70.00
Wire Rod and Skelp: (per pound)				
Wire rods	4.325¢	4.325¢	4.325¢	4.10¢
Skelp	3.55	3.55	3.55	3.35
† Add 4.7 pct to base and extras.				
Composite: (per pound)				
Finished steel base price	4.376¢	4.376¢	4.376¢	4.131¢

	Dec. 23 1952	Dec. 16 1952	Nov. 25 1952	Dec. 25 1951
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$60.69	$60.69	$60.69	$57.97
Foundry, Valley	55.00	55.00	55.00	52.50
Foundry, Southern, Cin'ti	58.93	58.93	58.93	55.58
Foundry, Birmingham	51.38	51.38	51.38	48.88
Foundry, Chicago†	55.00	55.00	55.00	52.50
Basic del'd Philadelphia	59.77	59.77	59.77	57.09
Basic, Valley furnace	54.50	54.50	54.50	52.00
Malleable, Chicago†	55.00	55.00	55.00	52.50
Malleable, Valley	55.00	55.00	55.00	52.50
Ferromanganese	226.25	226.25	226.25	186.25
† The switching charges for delivery to foundries in the Chicago district is $1 per ton.				
‡ Average of U. S. prices quoted on Ferroally pages.				
Composite: (per gross ton)				
Pig iron	$55.26	$55.26	$55.26	$52.72
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$43.00*	$43.00*	$43.00*	$43.00*
No. 1 steel, Phila. area	41.50*	41.50*	41.50*	41.50*
No. 1 steel, Chicago	41.50*	41.50*	41.50*	41.50*
No. 1 bundles, Detroit	41.15*	41.15*	41.15*	41.15*
Low phos., Youngstown	46.50*	46.50*	46.50*	46.50*
No. 1 cast, Pittsburgh	49.00†	49.00†	49.00†	49.00†
No. 1 cast, Philadelphia	44.50	44.50	46.50	49.00†
No. 1 cast, Chicago	43.50	43.50	43.50	49.00†
* Basing pt., less broker's fee. † Shipping pt., less broker's fee.				
Composite: (per gross ton)				
No. 1 heavy melting scrap	$42.00	$42.00	$42.00	$42.00
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.75	$14.75	$14.75	$14.75
Foundry coke, prompt	17.75	17.75	17.75	17.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	24.50	24.50	24.50	21.50
Copper, Lake, Conn.	24.625	24.625	24.625	24.625
Tin, Straits, New York	$1.21½†	$1.21½	$1.21⅜	$1.03
Zinc, East St. Louis	12.50	12.50	12.50	19.50
Lead, St. Louis	13.80	13.80	13.80	18.80
Aluminum virgin ingot	20.00	20.00	20.00	19.00
Nickel, electrolytic	59.58	59.58	59.58	59.58
Magnesium, ingot	24.50	24.50	24.50	24.50
Antimony, Laredo, Tex.	34.50	34.50	34.50	50.00
† Tentative.				

Composite Price Notes

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was to sensitive. (See p. 139 of May 12, 1949, issue.)

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Scrap Steel Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

Warehouse Price Notes

Base Quantities (Standard unless otherwise keyed): Cold finished bars; 2000 lb or over Alloy bars; 1000 to 1999 lb. All others; 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets, for quantity.

Exceptions: (1)500 to 1499 lb, (2)1500 to 3499 lb, (3)6000 lb or over, (4)450 to 1499 lb.

WAREHOUSES

Base price, f.o.b., dollars per 100 lb.

Cities	City Delivery Charge	Sheets: Hot-Rolled	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)	Strip: Hot-Rolled	Strip: Cold-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled	Bars: Cold-Finished	Alloy Bars: Hot-Rolled A 4615 As rolled	Alloy Bars: Hot-Rolled A 4140 Annealed	Alloy Bars: Cold-Drawn A 4615 As rolled	Alloy Bars: Cold-Drawn A 4140 Annealed
Baltimore	$.20	5.81	7.17	8.37-8.57	6.42	.....	6.30-6.47	6.47	6.41-6.71	7.18-7.43	.....	.....	.....	.....
Birmingham	.15	5.80	6.65	7.70[1]	5.80	.....	6.10	5.95-6.71	5.80	8.25-8.40	.....	.....	.....	.....
Boston	.20	6.48-6.52	7.35-7.52	8.54-8.63	6.55	8.50[3]	6.75-6.80	6.56-6.75	6.38-6.54	7.47	10.78	11.15-11.18	.....	13.18
Buffalo	.20	5.76-5.80	6.60-6.65	8.40-8.41	6.16-6.21	6.19	6.26-6.37	5.96-6.08	5.76-5.90	6.00-6.95	10.70	11.00-11.07	12.70	12.51-14.42
Chicago	.20	5.80-5.81	6.65	8.00	5.83-5.84	.....	5.95-6.00	5.95-6.98	5.83	6.56-6.92	.....	10.65	.....	12.65
Cincinnati	.15	6.13	6.72	8.47	6.14	.....	6.47	6.42	6.13	7.16	.....	11.07	.....	13.07
Cleveland	.20	5.80-5.81	6.65	8.14	6.00-6.01	.....	6.12-6.17	6.28-	5.89	6.66-6.90	.....	10.79	.....	12.79
Denver		7.17	.....	.....	7.43-7.69	8.90	7.37	7.50-7.80	7.61-7.71	8.24	.....	.....	.....	.....
Detroit	.20	6.00-6.07	6.81-6.92	8.64	6.13	7.99	6.45-6.47	6.12-6.45	6.12-	6.975-7.21	10.72	10.92	12.72	13.02
Houston	.20	6.74-6.79	7.78-7.79	8.68	6.61-6.75	9.80	6.63-7.07	6.66-6.79	6.82-6.98	9.08-9.62	11.90	11.90	.....	13.90
Indianapolis	del'd.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kansas City	.20	6.47	7.31	8.50-8.72	6.51	8.07	6.62-6.67	6.62	6.50	7.57	11.15-11.90	11.45-12.20	13.13-13.88	13.43-14.18
Los Angeles	.20	6.60	8.45	9.60	6.75	9.15	6.65-6.71	6.60-6.64	6.60	8.35-8.69	.....	12.05	.....	14.60
Memphis	.10	6.56	.....	.....	6.60	.....	6.71	6.71	6.57-6.83	7.98-9.98	.....	.....	.....	.....
Milwaukee	.20	5.97-5.98	6.82	8.17	6.00-6.01	.....	6.12-6.17	6.12	6.00	6.83-7.07	.....	10.82	.....	12.82
New Orleans	.15	6.28	7.12	.....	6.32	.....	6.43	6.43	6.31	7.85	.....	.....	.....	.....
New York	.30	6.26-6.69	7.27-7.60	8.31[2]-8.63	6.56-7.05	9.53	6.60-7.19	6.39-6.70	6.59-6.89	7.50-7.53	10.74-10.98	11.04-11.28	12.74-12.97	13.04-13.27
Norfolk	.20	7.10	.....	.....	6.81	.....	6.64	7.25	6.44	8.45	.....	.....	.....	.....
Philadelphia	.25	6.11-6.38	7.13-7.92	8.30-8.79	6.45-7.45	.....	6.24-6.86	6.17-6.42	6.42-6.68	7.45-7.69	10.57-10.74	10.79-11.04	12.74	12.79-13.04
Pittsburgh	.20	5.80-5.81	6.65	8.00-8.45	5.94-5.97	.....	6.00	5.95	5.83	6.66-6.90	.....	10.65	.....	12.65
Portland	.20	7.60-7.80	9.15-9.45	10.05	7.60-7.65	.....	7.27	7.30	7.35	9.45	.....	.....	.....	.....
Salt Lake City	.20	8.30	.....	10.90[4]	8.45	.....	7.85	8.00	8.40	.....	.....	.....	.....	.....
San Francisco	.15	6.90	8.20	9.60-10.40	6.75	9.25-9.70	6.75-6.85	6.50-6.65	6.65	8.40-8.70	.....	12.05	.....	14.60
Seattle	.20	7.16-7.37	8.83-9.17	9.80-9.85	7.14-7.69	.....	7.04-7.20	6.75-6.89	7.14-7.24	9.37-9.42	.....	11.70	.....	13.70
St. Louis	.20	6.10-6.30	6.94-7.83	8.30	6.14	9.73	6.35-6.60	6.35	6.13-6.33	6.96-7.40	10.65	10.95	12.65	12.95
St. Paul	.15	6.47	7.31	8.66	6.50	.....	6.61	6.61	6.49	7.32	.....	.....	.....	.....

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		INGOTS		BILLETS, BLOOMS, SLABS			PIPE SKELP	PIL-ING	SHAPES STRUCTURALS		STRIP			
		Carbon Forging Net Ton	Alloy Net Ton	Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton		Sheet Steel	Carbon	Hi Str. Low Alloy	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy
EAST	Bethlehem, Pa.					$76.00 *B3*			3.90 *B3*	5.80 *B3*				
	Buffalo, N. Y.			$59.00 *B3*	$70.50 *b3, R3*	$76.00 *B3, R3*		4.675 *B3*	3.90 *B3*	5.80 *B3*	3.725 *B3, R3*	5.10 *B3*	5.70 *B3*	7.90 *B3*
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.				$77.50 *A2*	$83.00 *A2*					4.125 *A2*		5.90 *A2*	
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.			$59.00 *B3*	$70.50 *B3*	$76.00 *B3*			3.90 *B3*	5.80 *B3*	3.725 *B3*			
	Newark, N. J.													
	New Haven, Conn.											5.60 *A5* 5.85 *D1*		
	Phoenixville, Pa.								6.10 *P2*					
	Putnam, Conn.													
	Sparrows Pt., Md.										3.725 *B3*	5.10 *B3*	5.70 *B3*	7.90 *B3*
	Worcester, Mass.													
	Trenton, N. J.											6.45 *R4*		
MIDDLE WEST	Alton, Ill.										4.20 *L1*			
	Ashland, Ky.										3.725 *A7*			
	Canton-Massillon, Ohio				$70.50 *R3*	$76.00 *R3* $78.00 *T5*								
	Chicago, Sterling, Ill.			$59.00 *U1*	$70.50 *U1, R3,W8*	$76.00 *U1, R3,W8*		4.675 *U1*	3.85 *U1, W8*	5.80 *U1*	3.725 *A1,W8* 4.725 *N4*	5.35 *A1*		
	Cleveland, Ohio				$70.50 *R3*							5.10 *A5, J3*		7.45 *J3*
	Detroit, Mich.	$56.00 *R5*	$57.00 *R5*		$73.50 *R5*	$79.00 *R5*					4.025 *G3* 4.40 *M2*	5.30 *G3* 5.45 *M2* 5.80 *D1* 6.05 *D2*	6.30 *G3*	8.15 *G3*
	Duluth, Minn.													
	Gary, Ind. Harbor Indiana			$59.00 *U1*	$70.50 *U1*	$76.00 *U1, Y1*		4.675 *I3*	3.85 *I3* *U1*	5.80 *I3, U1* 6.30 *Y1*	3.725 *I3, U1, Y1*	5.35 *I3*	5.65 *I3, U1* 6.15 *Y1*	
	Granite City, Ill.													
	Kokomo, Ind.													
	Middletown, Ohio											5.10 *A7*		
	Niles, Ohio Sharon, Pa.										4.225 *S1*	5.70 *T4* 5.80 *S1*	5.65 *S1*	7.30 *S1*
	Pittsburgh, Pa. Midland, Pa.	$54.00 *U1*	$57.00 *U1, C11*	$59.00 *U1, J3*	$70.50 *U1, j3*	$76.00 *U1, C11*	3.55 *U1* 3.65 *J3*	4.675 *U1*	3.85 *U1, J3*	5.80 *U1, J3*	3.725 *J3, A7* 3.975 *A3* 4.225 *S7, S9*	5.10 *J3, A7* 5.45 *A3* 5.80 *B4, S7*		
	Portsmouth, Ohio													
	Weirton Wheeling, Follansbee, W. Va.								4.10 *W3*		3.825 *W3*	5.10 *W3*	6.10 *W3*	7.95 *W3*
	Youngstown, Ohio					$76.00 *Y1, C10*	3.55 *U1* *R3*			6.30 *Y1*	3.725 *U1, Y1, R3*	5.10 *R3, Y1* 5.70 *C5* 5.80 *B4*	5.65 *R3, U1* 6.15 *Y1*	7.30 *R3* 7.80 *Y1*
WEST	Fontana, Cal.	$81.00 *K1*	$83.00 *K1*	$78.00 *K1*	$89.50 *K1*	$95.00 *K1*			4.45 *K1*	6.40 *K1*	4.975 *K1*	6.75 *K1*	6.55 *K1*	
	Geneva, Utah				$70.50 *C7*				3.85 *C7*	5.80 *C7*				
	Kansas City Mo.								4.45 *S2*		4.325 *S2*			
	Los Angeles Torrance, Cal.				$89.50 *B2*	$96.00 *B2*			4.45 *C7, B2*	6.35 *B2*	4.475 *C7, B2*	6.85 *C1*	6.40 *B2*	
	Minnequa, Colo.								4.30 *C6*		4.775 *C6*			
	San Francisco Niles, Pittsburg, Cal				$89.50 *B2*				4.40 *B2* 4.56 *P9*	6.30 *B2*	4.475 *C7, B2*		6.40 *B2*	
	Seattle, Wash.				$89.50 *B2*				4.50 *B2*	6.40 *B2*	4.725 *B2*		6.65 *B2*	
SOUTH	Atlanta, Ga										4.275 *A8*			
	Birmingham Ala. Alabama City, Ala.			$59.00 *T2*					3.85 *T2, R3*	5.80 *T2*	3.725 *T2, R3*			
	Houston, Texas		$65.00 *S2*		$78.50 *S2*	$84.00 *S2*			4.25 *S2*		4.125 *S2*			

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

IRON AGE

STEEL PRICES

SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE	
Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized *10* ga.	Enameling *12* ga.	Long Terne *10* ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled *19* ga.		Cokes* *1.25*-lb. base box	Electro* *0.25*-lb. base box	Holloware Enameling *29* ga.	
													Bethlehem, Pa.
3.775 *B3*	4.575 *B3*				5.675 *B3*	6.925 *B3*							Buffalo, N. Y.
										† Special coated mfg terne deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate 55 to 128 lb deduct $2.20 from 1.25-lb coke base box. * COKES: 1.50-lb add 25¢. ELECTRO: 0.50-lb add 25¢; 0.75-lb add 65¢.			Claymont, Del.
													Coatesville, Pa.
4.175 *A2*					5.925 *A2*								Conshohocken, Pa.
													Harrisburg, Pa.
													Hartford, Conn.
									4.325 *B3*				Johnstown, Pa.
													Newark, N. J.
													New Haven, Conn.
													Phoenixville, Pa.
													Putnam, Conn.
3.775 *B3*	4.575 *B3*	5.075 *B3*			5.675 *B3*	6.925 *B3*	7.775 *B3*		4.425 *B3*	$8.80 *B3*	$7.50 *B3*		Sparrows Pt., Md.
									4.625 *A5*				Worcester, Mass.
									4.425 *R4*				Trenton, N. J.
									4.70 *L1*				Alton, Ill.
3.775 *A7*		5.075 *A7*	4.925 *A7*										Ashland, Ky.
		5.075 *R3*											Canton-Massillon Ohio
3.775 *W8*					5.675 *U1*				4.325 *A5, N4, R3*				Chicago, Sterling, Ill.
3.775 *R3, J3*	4.575 *R3, J3*		4.925 *R3*		5.675 *R3, J3*	6.925 *R3, J3*			4.325 *A5*				Cleveland, Ohio
3.975 *G3*	4.775 *G3*				6.225 *G3*	7.475 *G3*							Detroit, Mich.
													Duluth, Minn.
3.775 *I3, U1, Y1*	4.575 *I3, U1, Y1*	5.075 *I3, U1*	4.925 *U1*	5.475 *U1*	5.675 *I3, U1* 6.175 *Y1*	6.925 *I3, U1* 7.425 *Y1*			4.325 *Y1*	$8.70 *U1, I3, Y1*	$7.40 *U1, I3*	6.10 *U1, Y1*	Gary, Ind. Harbor, Indiana
4.30 *G2*	5.275 *G2*	5.50 *G2*	5.625 *G2*								$7.60 *G2*	6.30 *G2*	Granite City, Ill.
		5.475 *C9*											Kokomo, Ind.
	4.575 *A7*		4.925 *A7*	5.475 *A7*									Middletown, Ohio
4.175 *S1*					5.675 *S1*						$7.40 *R3*		Niles, Ohio Sharon, Pa.
3.775 *U1, J3, A7* 3.925 *A3*	4.575 *U1, J3, A7*	5.075 *U1*	4.925 *U1*		5.675 *U1, J3*	6.925 *U1, J3*	7.625 *U1*		4.325 *A5* 4.525 *P6*	$8.70 *U1, J3*	$7.40 *U1, J3*	6.10 *U1*	Pittsburgh, Pa. Midland, Pa.
									4.525 *P7*				Portsmouth, Ohio
3.775 *W3, W5*	4.575 *W3, W5*	5.075 *W3, W5*		5.475 *W3, W5*	6.025 *W3*	7.275 *W3*				$8.70 *W3, W5*	$7.40 *W3, W5*	6.35 *W5*	Weirton, Wheeling, Follansbee, W. Va.
3.775 *U1, R3, Y1*	4.575 *R3, Y1*	5.775 *R1*	4.925 *Y1*	6.05 *E2*	5.675 *R3, U1* 6.175 *Y1*	6.925 *R3* 7.425 *Y1*		5.65 *E2* 5.825 *R1*	4.325 *Y1*	$8.70 *R3*			Youngstown, Ohio
4.725 *K1*	5.525 *K1*				6.625 *K1*	7.875 *K1*			5.125 *K1*				Fontana, Cal.
3.875 *C7*													Geneva, Utah
													Kansas City, Mo.
4.475 *C7*		5.825 *C7*						5.575 *C7*	5.125 *C7, B2*				Los Angeles, Torrance, Cal.
									4.575 *C6*				Minnequa, Colo.
4.475 *C7*	5.525 *C7*	5.825 *C7*							4.975 *C7*	$9.45 *C7*	$8.15 *C7*		San Francisco, Niles, Pittsburg, Cal.
													Seattle, Wash.
													Atlanta, Ga.
3.575 *T2, R3*	4.575 *T2*	5.075 *T2, R3*			5.675 *T2*			4.925 *R3*	4.325 *T2, R3*	$8.80 *T2*	$7.50 *T2*		Birmingham, Ala. Alabama City Ala.
									4.725 *S2*				Houston, Tex.

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfgr's. Bright
EAST	Bethlehem, Pa.				4.675 *B3*	6.00 *B3*	5.925 *B3*					
	Buffalo, N. Y.	3.95 *B3,R3*	3.95 *B3,R3*	4.975 *B5*	4.675 *B3,R3*	6.00 *B3,B5*	5.925 *B3*	3.90 *B3*			5.95 *B3*	
	Claymont, Del.							4.35 *C4*		5.35 *C4*		
	Coatesville, Pa.							4.35 *L4*		5.75 *L4*		
	Conshocken, Pa.							4.35 *A2*	4.95 *A2*		6.20 *A2*	
	Harrisburg, Pa.							6.50 *C3*	6.50 *C3*			
	Hartford, Conn.			5.475 *R3*		6.45 *R3*						
	Johnstown, Pa.	3.95 *B3*	3.95 *B3*		4.675 *B3*		5.925 *B3*	3.90 *B3*		5.25 *B3*	5.95 *B3*	5.225 *B3*
	Newark, N. J.			5.375 *W10*		6.35 *W10*						
	New Haven, Conn.											
	Phoenixville, Pa.											
	Putnam, Conn.			5.475 *W10*								
	Sparrows Pt. Md.		3.95 *B3*					3.90 *B3*		5.25 *B3*	5.95 *B3*	5.325 *B3*
	Worcester, Mass.					6.35 *A5*						5.525 *A5*
	Trenton, N. J.											
MIDDLE WEST	Alton, Ill.	4.50 *L1*										5.45 *L1*
	Ashland, Ky.							3.90 *A7*				
	Canton-Massillon	3.95 *R3*		4.925 *R2,R3*	4.675 *R3* 4.72 *T5*	5.99 *T5* 6.00 *R2,R3*						
	Chicago, Sterling, Ill.	3.95 *U,W8, R3* 4.55 *N4*	3.95 *R3* 4.70 *N4*	4.925 *A5,B5, W8,W10*	4.675 *R3, U1, W8*	6.00 *B5,L2, R3,W8,W10* 6.05 *A5*		3.90 *U1,W8*	4.95 *U1*	5.25 *U1*	5.95 *U1*	5.225 *A3, N4,R3* 5.325 *K2* 5.475 *W7*
	Cleveland, Ohio	3.95 *R3*	3.95 *R3*	4.925 *A5,C13*		6.00 *C13* 6.05 *A5*	5.925 *R3*	3.90 *R3,J3*	4.95 *J3*		5.95 *R3,J3*	5.225 *A5, C13,R3*
	Detroit, Mich.	4.10 *R5* 4.30 *G3*		5.075 *R5,P8* 5.175 *P3*	4.825 *R5* 5.025 *G3*	6.15 *R5,P8* 6.20 *P3*	6.675 *G3*	4.45 *G3*			6.90 *G3*	
	Duluth, Minn.											5.252 *A5*
	Gary, Ind. Harbor, Indiana	3.95 *I3, U1, Y1*	3.95 *I3, U1, Y1*	4.925 *L2, M5,R3*	4.675 *I3, U1, Y1*	6.90 *L2,M5, R3,R5*	5.925 *I3, U1,* 6.425 *Y1*	3.90 *I3, U1 Y1*	4.95 *I3*	5.25 *U1*	5.95 *I3, U1* 6.45 *Y1*	5.325 *M4*
	Granite City, Ill.							4.60 *G2*				
	Kokomo, Ind.											5.325 *C9*
	Middletown, Ohio											
	Niles, Ohio Sharon, Pa.							4.15 *S1*		5.70 *S1*	5.95 *S1*	
	Pittsburgh, Pa. Midland, Pa.	3.95 *U1, J3*	3.95 *U1, J3*	4.925 *A5, J3, W10,R3,C8*	4.675 *U1, J3, C11*	6.00 *C8,C11, W10,* 6.05 *A5*	5.925 *U1, J3,*	3.90 *U1, J3*	4.95 *U1, J3*	5.25 *U1, J3*	5.95 *U1, J3*	5.225 *A5, J3* 5.475 *P6*
	Portsmouth, Ohio											5.625 *P7*
	Weirton, Wheeling, Follansbee, W. Va.	4.10 *W3*						3.90 *W5* 4.20 *W3*				
	Youngstown, Ohio	3.95 *U1, Y1, R3*	3.95 *U1, Y1, R3*	4.925 *Y1*	4.675 *U1,C10, Y1*	6.00 *C10, Y1*	5.925 *U1* 6.425 *Y1*	3.90 *U1, Y1, R3*			5.95 *R3* 6.45 *Y1*	5.225 *Y1*
WEST	Fontana, Cal.	4.65 *K1*	4.65 *K1*		5.725 *K1*		6.975 *K1*	4.50 *K1*		6.20 *K1*	6.55 *K1*	
	Geneva, Utah							3.90 *C7*			5.95 *C7*	
	Kansas City, Mo.	4.55 *S2*	4.55 *S2*		5.275 *S2*							5.825 *S1*
	Los Angeles, Torrance, Cal.	4.65 *C7,B2*	4.65 *C7,B2*	6.375 *R3*	5.725 *B2*		6.625 *B2*					6.175 *C7,B1*
	Minnequa, Colo.	4.40 *C6*	4.75 *C6*					4.70 *C6*				5.475 *C6*
	San Francisco, Niles, Pittsburg, Cal.	4.65 *C7,P9* 4.70 *B2*	4.65 *C7,P9* 4.70 *B2*				6.675 *B2*					6.175 *C6,C7*
	Seattle, Wash.	4.70 *B2*	4.70 *B2*				6.675 *B2*	4.80 *B2*			6.85 *B2*	
SOUTH	Atlanta, Ga.	4.50 *A8*	4.50 *A8*									5.475 *A8*
	Birmingham, Ala. Alabama City, Ala.	3.95 *T2,R3*	3.95 *T2,R3*				5.925 *T2*	3.90 *T2,R3*			5.95 *T2*	5.225 *T2, R3*
	Houston, Texas	4.35 *S2*	4.35 *S2*		5.075 *S2*			4.30 *S2*				5.625 *S2*

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angell Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, O.
A8 Atlantic Steel Co., Atlanta, Ga.

B1 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin Inc., Harvey, Ill.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metal Products Co., Youngstown
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia-Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Glassport, Pa.
C11 Crucible Steel Co. of America, New York
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland

D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling Inc., McKeesport, Pa.
F2 Fitzsimmons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G1 Globe Iron Co., Jackson, O.
G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Co., Inc., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.

N1 National Supply Co., Pittsburgh
N2 National Tube Co., Pittsburgh
N3 Niles Rolling Mills Co., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.

O1 Oliver Iron & Steel Co., Pittsburgh

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co. (John A.), Trenton, N.
R5 Rotary Electric Steel Co., Detroit

S1 Sharon Stee Corp., Sharon, Pa.
S2 Sheffield Steel Corp., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw & Steel Co., Fitchburg, Mass.
S5 Sloss Sheffield Steel & Iron Co., Birmingham
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Sweet's Steel Co., Williamsport, Pa.
S11 Seidelhuber Steel Rolling Mills, Seattle

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Birmingham
T3 Tennessee Products & Chem. Cor., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T6 Tremont Nail Co., Wareham, Mass.

U1 United States Steel Co., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Co., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh

Y1 Youngstown Sheet & Tube Co., Youngstown

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails Col	Woven Wire Fence 9-15½ ga. Col	Fence Posts Col	Single Loop Bale Ties Col	Twisted Barbless Wire Col	Gal. Barbed Wire Col	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Gal. ¢/lb.
Alabama City *R3*†	127	135	...	132	...	144	6.075	6.325
Aliquippa, Pa. *J3*	127	141	...	...	...	148	6.075	6.525
Atlanta *A8*	130	140	...	135	...	149	6.325	6.675
Bartonville *K2*	127	139	140	132	148	148	6.075	6.50
Buffalo *W6*	...	...	...	...	...	...	...	...
Chicago *N4*	127	137	...	132	146	146	6.075	6.40
Cleveland *A6*	...	...	...	...	...	...	...	...
Cleveland *A5*	...	...	...	...	...	...	6.075	6.225
Crawfordsville *M4*	130	140	...	134	...	149	6.175	6.55
Donora, Pa. *A5*	127	133	...	132	...	142	6.075	6.225
Duluth *A5*	118	133	...	132	...	142	6.075	6.225
Fairfield, Ala. *T2*	127	133	...	132	...	142	6.075	6.225
Houston *S2*	135	147	...	...	...	156	6.475	6.925
Johnstn, Pa. *B3*	127	...	148	...	149	...	...	6.575
Joliet, Ill. *A5*	127	133	...	132	...	142	6.075	6.225
Kokomo, Ind. *C9*	...	...	142	...	...	...	6.175	6.425
Los Angeles *B2*	...	...	...	...	...	...	7.025	...
Kansas City *S2*	139	...	...	144	...	160	6.675	7.125
Minnequa *C6*	132	146	138	137	...	153	6.325	6.70
Moline, Ill. *R3*	...	...	136	...	...	...	...	...
Pittsburg, Cal. *C7*	146	156	...	156	162	162	7.025	7.125
Monessen *P6*	127	138	...	...	147	147	6.075	6.45
Portsmouth *P7*	132	...	...	...	...	...	6.47	...
Rankin, Pa. *A5*	127	133	...	...	...	142	6.075	6.225
So. Chicago *R3*†	127	135	140	132	...	144	6.075	6.325
S. San Fran. *C6*	...	...	...	156	...	167	7.025	7.40
Sparrows Pt. *B3*	129	...	...	134	151	...	...	6.675
Struthers, O. *Y1*‡	...	...	...	...	...	...	6.075	6.475
Torrance, Cal. *C7*	146	...	...	...	...	...	7.025	...
Worcester *A5*	133	...	...	...	...	...	6.375	6.525
Williamsport, Pa. *S10*	...	...	...	...	...	...	...	...

Cut Nails, carloads base $7.80 per 100 lb. (less 20¢ to jobbers) at Conshohocken Pa. (*A2*) Wheeling, W. Va. (*W5*) $7.80.

Zinc extra if not included on Galv. Merch. Wire

‡ Galv. Merch. Wire based on 15¢ Zinc.

STAINLESS STEELS

Base price, cents per lb., f.o.b. mill. Add 4.7 pct to base and extras.

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	14.25	15.25	16.75	16.25	24.75	20.00	21.75	12.75	14.75	13.00
Slabs, billets, rerolling	18.50	20.00	22.00	21.00	32.25	26.25	28.50	16.50	20.00	16.75
Forg. discs, die blocks, rings	34.00	34.25	36.75	35.75	53.00	40.25	44.75	28.00	28.50	28.50
Billets, forging	26.25	26.50	28.50	27.75	41.50	31.25	35.00	21.50	22.00	22.00
Bars, wires, structurals	31.25	31.50	34.00	33.00	49.25	37.00	41.50	25.75	26.25	26.25
Plates	33.00	33.25	35.25	35.25	52.00	40.75	45.25	27.00	27.50	27.50
Sheets	41.00	41.25	43.25	43.25	57.00	49.25	53.75	36.50	37.00	39.00
Strip, hot-rolled	26.50	28.25	32.50	30.25	48.75	37.00	41.25	23.50	30.25	24.00
Strip, cold-rolled	34.00	36.75	40.25	38.75	59.00	48.25	52.25	30.50	37.00	31.00

STAINLESS STEEL PRODUCING POINTS—*Sheets:* Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* McKeesport, Pa., *U1;* Washington, Pa., *W2;* (type 316 add 4.5¢) *J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Ft. Wayne, *J4;* Lockport, N. Y., *R4*

Strip: Midland, Pa., *C11;* Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2,* (type 316 add 4.5¢); W. Leechburg, Pa., *A3;* Bridgeville, Pa., *U2;* Detroit, *M2;* Canton-Massillon, O., *R3;* Middletown, O., *A7;* Harrison, N. J., *D3;* Youngstown, *C5;* Lockport, N. Y., *S4;* Sharon, Pa., *S1* (type 301 add ¼¢); Butler, Pa., *A7;* Wallingford, Conn., *W1*

Bars: Baltimore, *A7;* Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2,* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1,F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon O., *R3;* Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Lockport, N. Y., *S4;* Canton, O., *T5;* Ft. Wayne, *J4.*

Wires: Waukegan, *A5,* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2.*

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11.*

Plates: Brackenridge, Pa., *A3* (type 416 add ½¢); Butler, Pa., *A7;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Lockport, N. Y., *S4;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3*

Forged discs, die blocks, rings: Pittsburgh, *C11;* Syracuse, *C11;* Ferndale, Mich., *A3;* Washington, Pa., *J2.*

Forging billets: Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3;* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11.*

ALLEGHENY LUDLUM—Slightly higher on Type 301; slightly lower on others in 300 series.

WASHINGTON STEEL—Slightly lower on 300 series except where noted.

PIPE AND TUBING

Base discounts f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS					
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½–3 In.		2 In.		2½–3 In.		3½–4 In.	
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
STANDARD T. & C.																				
Sparrows Pt. *B3*	30.5	8.25	33.5	12.25	35.5	15.75	36.5	16.25	37.0	17.25	37.5	17.75	38.0	18.25						
Youngstown *R3*	32.5	10.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25						
Fontana *K1*	21.0	+1.25	24.0	2.75	26.5	6.25	27.0	6.75	27.5	7.75	28.0	8.25	28.5	8.75						
Pittsburgh *J3*	32.5	10.25	35.5	13.25	38.0	15.75	38.5	16.75	39.0	17.25	39.5	17.75	40.0	18.75	24.0	2.25	27.0	5.75	29.0	7.75
Alton, Ill. *L1*	31.5	9.25	34.5	13.25	37.0	16.75	37.5	17.25	38.0	18.25	38.5	18.75	39.0	19.25						
Sharon *M3*	32.5	9.25	35.5	13.25	38.0	16.25	38.5	16.75	39.0	17.25	39.5	17.75	40.0	18.25						
Pittsburgh *N1*	32.5	10.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25	24.0		27.0		29.0	
Wheeling *W5*	32.5	10.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25						
Wheatland *W4*	32.5	10.25	35.5	13.25	38.0	15.75	38.5	16.75	39.0	17.25	39.5	17.75	40.0	18.75						
Youngstown *Y1*	32.5	10.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25	24.0	3.75	27.0	6.75	29.0	8.75
Indiana Harbor *Y1*	31.5	9.25	34.5	13.25	37.0	16.75	37.5	17.25	38.0	18.25	38.5	18.75	39.0	19.25						
Lorain *N2*	32.5	15.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25	24.0	3.75	27.0	6.75	29.0	8.75
EXTRA STRONG PLAIN ENDS																				
Sparrows Pt. *B3*	30.25	9.5	34.25	13.5	36.25	17.0	36.75	17.5	37.25	18.5	37.75	19.0	38.25	19.5						
Youngstown *R3*	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	21.5						
Fontana *K1*	20.75		24.75		26.75		27.25		27.75		28.25		28.75							
Pittsburgh *J3*	32.25	10.0	36.25	14.0	38.25	16.0	38.75	17.0	39.25	17.5	39.75	18.0	40.25	19.0	23.75	2.0	27.75	6.5	31.25	10.0
Alton, Ill. *L1*	29.25	8.5	33.25	12.5	35.25	16.0	35.75	16.5	36.25	17.5	36.75	18.0	37.25	18.5						
Sharon *M3*	32.25	10.5	36.25	14.5	38.25	17.5	38.75	18.0	39.25	18.5	39.75	19.0	40.25	19.5						
Pittsburgh *N1*	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	21.5	23.75		27.75		31.25	
Wheeling *W5*	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	21.5						
Wheatland *W4*	32.25	10.0	36.25	14.0	38.25	16.0	38.75	17.0	39.25	17.5	39.75	18.0	40.25	19.0						
Youngstown *Y1*	32.25	11.5	36.25	15.5	37.75	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	22.5	23.75	4.5	27.75	8.5	31.25	12.0
Indiana Harbor *Y1*	31.25	10.5	35.25	14.5	37.25	17.5	37.75	18.5	38.25	19.5	38.75	20.0	39.25	20.5						
Lorain *N2*	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	21.5	23.75	4.5	27.75	8.5	31.25	12.0

Galvanized discounts based on zinc, at 17¢ per lb, East St. Louis. For each 1¢ change in zinc, discounts vary as follows: ½ in., ¾ in., and 1 in., 1 pt.; 1¼ in., 1½ in., 2 in., ¾ pt., 2½ in., 3 in., ½ pt. Calculate discounts on even cents per lb of zinc, i.e., if zinc is 16.51¢ to 17.50¢ per lb, use 17¢. Jones & Laughlin discounts apply only when zinc price changes 1¢.
Threads only buttweld and seamless, 1 pt. higher discount. Plain ends, buttweld and seamless, 3 in. and under, 3¾ pts. higher discount. Buttweld jobbers' discount, 5 pct
St. Louis zinc price now 12.5¢.

COKE

	Net-Ton
Furnace, beehive (f.o.b. oven)	
Connellsville, Pa.	$14.50 to $15.00
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	$17.50 to $18.00
Foundry, oven coke	
Buffalo, del'd	$28.08
Chicago, f.o.b.	24.50
Detroit, f.o.b.	25.50
New England, del'd	26.05
Seaboard, N. J., f.o.b.	22.75
Philadelphia, f.o.b.	23.95
Swedeland, Pa., f.o.b.	23.86
Painesville, Ohio, f.o.b.	24.00
Erie, Pa., f.o.b.	23.50
Cleveland, del'd	27.43
Cincinnati, del'd	26.56
St. Paul, f.o.b.	22.50
St. Louis, f.o.b.	26.00
Birmingham, del'd	23.21
Neville Island	23.00
Lone Star, Tex., f.o.b.	18.50

ELECTRICAL SHEETS

22 Ga. H-R cut length F.o.b. Mill Cents Per Lb.	Armature	Elec.	Motor	Dynamo	Transf. 72	Transf. 65	Transf. 58
Beech Bottom *W5*		7.85	9.10	9.90	10.45	11.00	11.70
Brackenridge *A3*	7.35	7.85	9.10	9.90	10.45	11.00	11.70
Granite City *G2*		8.55	9.80				
Ind. Harbor *I3*	7.35	7.85	9.10				
Mansfield *E2*	7.35	7.85	9.10	9.90			
Niles, O. *N3*	7.35	7.85					
Vandergrift *U1*	7.35	7.85	9.10	9.90	10.45	11.00	11.70
Warren, O. *R3*	7.35	7.85	9.10				
Zanesville *A7*	7.35	7.85	9.10	9.90	10.45	11.00	11.70

CAST IRON WATER PIPE

	Per Net Ton
6 to 24-in., del'd Chicago	$110.30 to $113.80
6 to 24-in., del'd N.Y.	113.50 to 114.50
6 to 24-in., Birminghtm	96.50 to 101.00
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipments; rail and water shipments less	$128.00 to $130.00

Class "A" and gas pipe, $5 extra; 4-in pipe is $5 a ton above 6-in.

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size		Seamless		Elec. Weld	
	OD-In.	B.W. Ga.	H.R.	C.D.	H.R.	C.D.
Babcock & Wilcox	2	13	23.93	28.14	23.19	27.28
	2½	12	32.17	37.83	31.19	36.67
	3	12	35.78	42.11	34.69	40.82
	3½	11	44.72	52.65	43.36	51.05
	4	10	55.52	65.31	53.83	63.32
National Tube	2	13	22.81	27.94	22.23	
	2½	12	31.28	38.31	30.51	
	3	12	35.87	43.93	34.98	
	3½	11	42.56	52.12		
	4	10	54.02	66.16		
Pittsburgh Steel	2	13		28.58		
	2½	12	32.16	39.19		
	3	12	36.87	44.93		
	3½	11	43.76	53.32		
	4	10		67.68		

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Foundry	Malleable	Bessemer	Low Phos.	Bl. Furnace Silvery
Bethlehem *B3*	56.50	57.00	57.50	58.00		
Birmingham *R3*	50.88	51.38				
Birmingham *W9*	50.88	51.38				
Birmingham *S5*	50.88	51.38				
Buffalo *R3*	54.50	55.00	55.50			
Buffalo *H1*	54.50	55.00	55.50			66.75
Buffalo *W6*	54.50	55.00	55.50			
Chicago *I4*	54.50	55.00	55.00	55.50		
Cleveland *A5*	54.50	55.00	55.00	55.50	59.50	
Cleveland *R3*	54.50	55.00	55.00			
Daingerfield, Tex. *L3*	50.50	51.00	51.00			
Duluth *I4*	54.50	55.00	55.00	55.50		
Erie *I4*	54.50	55.00	55.00	55.50		
Everett, Mass. *M6*		59.25	59.75			
Fontana *K1*	60.50	61.00				
Geneva, Utah *C7*	54.50	55.00				
Granite City, Ill. *K3*	56.40	56.90	57.40			
Hubbard, Ohio *Y1*	54.50	55.00	55.00			
Jackson, Ohio *J1,G1*						65.50
Minnequa *C6*	56.50	57.50	57.50			
Monessen *P6*	56.50					
Neville Island *P4*	54.50	55.00	55.00	55.50		
Pittsburgh *U1*	54.50			55.50		
Sharpsville *S3*	54.50	55.00	55.00	55.50		
Steelton *B3*	56.50	57.00	57.50	58.00	62.50	
Swedeland *A2*	58.50	59.00	59.50	60.00		
Toledo *I4*	54.50	55.00	55.00	55.50		
Troy, N. Y. *R3*	56.50	57.00	57.50		62.50	
Youngstown *Y1*	54.50	55.00	55.00	55.50		
N. Tonawanda, N. Y. *T1*		55.00	55.50			

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base, (1.75 to 2.25 pct, except low phos., 1.75 to 2.00 pct), 50¢ per ton for each 0.50 pct manganese over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Subtract 38¢ per ton for phosphorus, content 0.70 pct and over. Silvery iron: Add $1.50 per ton net for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. $1 per ton for 0.75 pct or more phosphorus, manganese as above. Bessemer ferro silicon prices are $1 over comparable silvery iron.

C-R SPRING STEEL

Cents Per Lb. F.o.b. Mill	CARBON CONTENT				
	0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Bridgeport, Conn.* *S7*	5.80	7.65	8.25	10.20	12.50
Carnegie, Pa. *S9*		7.65	8.25	10.20	12.50
Cleveland *A5*	5.10	7.30	8.25	10.20	12.50
Detroit *D1*	6.45	7.50	8.10		
New Castle, Pa. *B4*	5.80	7.65	8.25	10.20	
New Haven, Conn. *D1*	6.70	7.60	8.20		
Sharon, Pa. *S1*	5.80	7.65	8.25	10.20	12.50
Trenton, N. J. *R4*		7.95	8.55	10.50	12.80
Warren, Ohio *T4*	6.20	7.65	8.25	10.20	12.50
Weirton, W. Va. *W3*	5.80	7.65	8.25	10.20	12.50
Worcester, Mass. *A5*	5.40	7.60	8.55	10.50	12.80
Youngstown *C5*		7.65	8.25	10.20	12.50

*Sold on Pittsburgh base.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer *U1*	3.775	4.25	4.925				
Chicago *R3*				6.65			
Cleveland *R3*							
Ensley *T2*	3.775	4.25					
Fairfield *T2*		4.25		6.65		4.775	
Gary *U1*	3.775	4.25				4.775	
Ind. Harbor *I3*	3.775		4.925	6.65		4.775	
Johnstown *B3*		4.25					
Joliet *U1*		4.25	4.925				
Kansas City *S2*							
Lackawanna *B3*	3.775	4.25	4.925			4.775	
Lebanon *B3*				6.65			
Minnequa *C6*	3.775	4.75	4.925	6.65		4.775	9.85
Pittsburgh *R3*							
Pittsburgh *O1*							
Pittsburgh *P5*							
Pittsburgh *J3*				6.65			
Pitt'g,Cal. *C7*						4.925	
Seattle *B2*				7.15		4.925	
Steelton *B3*	3.775		4.925			4.775	
Struthers *Y1*				6.65			
Torrance *C7*						4.925	
Youngstown *R3*				6.65			

TOOL STEEL

F.o.b. mill

Add 4.7 pct to base and extras.

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.505
18	4	1	—	5	$2.13
18	4	2	—	—	$1.65
1.5	4	1.5	8	—	81.0¢
6	4	2	6	—	96.5¢

High-carbon chromium ..... 63.5¢
Oil hardened manganese ..... 35¢
Special carbon ..... 32.5¢
Extra carbon ..... 27¢
Regular carbon ..... 23¢

Warehouse prices on and east of Mississippi are 3.5¢ per lb. higher. West of Mississippi, 5.5¢ higher.

CLAD STEEL

Add 4.7 pct to base and extras.

	Plate	Sheet
Stainless-carbon		
No. 304, 20 pct.		
Coatesville, Pa. *L4*	*29.5	
Washington, Pa. *J2*	*29.5	
Claymont, Del. *C4*	*29.50	
Conshohocken, Pa. *A2*		*27.50
New Castle, Ind. *I2*	*29.77	*26.24
Nickel-carbon		
10 pct Coatesville, Pa. *L4*	32.5	
Inconel-carbon		
10 pct Coatesville, Pa. *L4*	40.5	
Monel-carbon		
10 pct Coatesville, Pa. *L4*	33.5	
No. 302 Stainless-copper stainless, Carnegie, Pa. *A4*		77.00
Aluminized steel sheets, hot dip, Butler, Pa. *A7*		7.75

* Includes annealing and pickling, or sandblasting.

ELECTRODES

Cents per lb, f.o.b., plant threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb.
	GRAPHITE	
17, 18, 20	60, 72	17.85
8 to 16	48, 60, 72	17.85
7	48, 60	19.57
6	48, 60	20.95
4, 5	40	21.50
3	40	22.61
2½	24, 30	23.15
2	24, 30	25.36
	CARBON	
40	100, 110	8.45
35	65, 110	8.45
30	65, 84, 110	8.45
24	72 to 104	8.45
20	84, 90	8.45
17	60, 72	8.45
14	60, 72	9.02
10, 12	60	9.30
8	60	9.58

FLUORSPAR

Washed gravel, f.o.b. Rosiclaire, Ill. Price, net ton; Effective CaF_2 content:

70% or more $43.00
60% or less 40.00

BOLTS, NUTS, RIVETS, SCREWS

Consumer, Prices

(Base, discount, f.o.b. mill, Pittsburgh, Cleveland, Birmingham or Chicago)

Nuts, Hot Pressed, Cold Punched—Sq.

Pct Off List

	Reg. Less Keg.	Reg. K.	Hvy. Less Keg.	Hvy. K.
½ in. & smaller	15	28½	15	28½
9/16 in. & ⅝ in.	12	25	6½	21
¾ in. to 1½ in. inclusive	9	23	1	16½
1⅝ in. & larger	7½	22	1	16½

Nuts, Hot Pressed—Hexagon

½ in. & smaller	26	37	22	34
9/16 in. & ⅝ in.	16½	29½	6½	21
¾ in. to 1½ in. inclusive	12	25	2	17½
1⅝ in. & larger	8½	23	2	17½

Nuts, Cold Punched—Hexagon

½ in. & smaller	26	37	22	34
9/16 in. & ⅝ in.	23	35	17½	30½
¾ in. to 1½ in. inclusive	19½	31½	12	25
1⅝ in. & larger	8½	23	2	17½

Nuts, Semi-Finished—Hexagon

	Reg.		Hvy.	
½ in. & smaller	35	45	28½	29½
9/16 in. & ⅝ in.	23	35	17½	30½
¾ in. to 1½ in. inclusive	24	36	15	28½
1⅝ in. & larger	13	26	8½	23
	Light			
7/16 in. & smaller	35	45		
½ in. thru ⅝ in.	28½	39½		
¾ in. to 1½ in. inclusive	26	37		

Stove Bolts *Pct Off List*

Packaged, steel, plain finished 48—10
Packaged, plain finish ..... 31—10
Bulk, plain finish** 62*

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

**Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Rivets *Base per 100 lb*

½ in. & larger $7.85

Cap and Set Screws

(In bulk) *Pct Off List*

Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright	54
¾ in. thru 1 in. up to & including 6 in.	48
¼ in. thru ⅝ in. x 6 in. & shorter high C double heat treat	46
1⅛ in. thru 1 in. up to & including 6 in.	41
Milled studs	35
Flat head cap screws, listed sizes	16
Fillister head cap, listed sizes	34
Set screws, sq head, cup point, 1 in. diam. and smaller x 6 in. & shorter	53

Machine and Carriage Bolts

Pct Off List

	Less Case	C.
½ in. & smaller x 6 in. & shorter	15	28½
9/16 in. & ⅝ in. x 6 in. & shorter	18½	30½
¾ in. & larger x 6 in. & shorter	17½	29½
All diam. longer than 6 in.	14	27½
Lag, all diam. x 6 in. & shorter	23	35
Lag, all diam. longer than 6 in.	21	33
Plow bolts	34	

REFRACTORIES

Fire Clay Brick *Carloads, per 1000*

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5) $94.60
No. 1 Ohio 88.00
Sec. quality, Pa., Md., Ky., Mo., Ill. .. 88.00
No. 2 Ohio 79.20
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50) 13.75

Silica Brick

Mt. Union, Pa., Ensley, Ala. $94.60
Childs, Pa. 99.00
Hays, Pa. 100.10
Chicago District 104.50
Western Utah and Calif. 111.10
Super Duty, Hays, Pa., Athens, Tex., Chicago 111.10
Silica cement, net ton, bulk, Eastern (except Hays, Pa.) 16.50
Silica cement, net ton, bulk, Hays, Pa. 18.70
Silica cement, net ton, bulk, Ensley, Ala. 17.60
Silica cement, net ton, bulk, Chicago District 17.60
Silica cement, net ton, bulk, Utah and Calif. 24.70

Chrome Brick *Per Net Ton*

Standard chemically bonded Balt., Chester $82.00

Magnesite Brick

Standard, Baltimore $104.00
Chemically bonded, Baltimore 93.00

Grain Magnesite *St. ⅜-in. grains*

Domestic, f.o.b. Baltimore in bulk fines removed $62.70
Domestic, f.o.b. Chewalah, Wash., in bulk 36.30
in sacks 41.80

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢ .. $13.75

LAKE SUPERIOR ORES

51.50% Fe; natural content, delivered lower Lake ports. Prices effective July 26, 1952

Gross Ton

Old range, bessemer 9.45
Old range, nonbessemer 9.30
Mesabi, bessemer 9.20
Mesabi, nonbessemer 9.05
High phosphorus 9.05

After adjustments for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 1, 1950, in Lake vessel rates, upper Lake rail freights, dock handling charges and taxes thereon.

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags ..... 10.9¢
Canadian sponge iron, del'd. in East ..... 12.0¢
Domestic sponge iron, 98+% Fe, carload lots ..... 15.5¢ to 17.0¢
Electrolytic iron, annealed, 99.5+% Fe ..... 44.0¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe ..... 60.0¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe ..... 53.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe ..... 83.0¢ to $1.48
Aluminum ..... 31.5¢
Brass, 10 ton lots ..... 30.00¢ to 33.25¢
Copper, electrolytic ..... 10.75¢ plus metal value
Copper reduced ..... 10.00¢ plus metal value
Cadmium, 100-199 lb ..... 95¢ plus metal value
Chromium, electrolytic, 99% min., and quantity, del'd $3.50
Lead ..... 7.5¢ to 12.0¢ plus metal value
Manganese ..... 57.0¢
Molybdenum, 99% $2.75
Nickel, unannealed ..... 88.0¢
Nickel, annealed ..... 95.0¢
Nickel, spherical, unannealed ..... 92.8¢
Silicon ..... 38.5¢
Solder powder ..... 7.0¢ to 9.0¢ plus met. value
Stainless steel, 302 ..... 83.0¢
Stainless steel, 316 ..... $1.10
Tin ..... 14.00¢ plus metal value
Tungsten, 99% (65 mesh) $6.00
Zinc, 10 ton lots ..... 23.0¢ to 30.5¢

Miscellaneous Prices

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk in carloads delivered. (65-72% Cr, 2% max. Si.)

0.06% C	34.50	0.20% C	33.50
0.10% C	34.00	0.50% C	33.25
0.15% C	33.75	1.00% C	33.00
2.00% C			32.75
65-69% Cr, 4-9% C			24.75
62-66% Cr, 4-6% C, 6-9% Si			25.60

S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	25.85
Ton lots	28.00
Less ton lots	29.50

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 3¢ for each additional 0.25% N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	$1.18
0.50% max. C	1.14
9 to 11% C	1.11

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 25.75¢ per lb of contained Cr plus 12.40¢ per lb of contained Si.

Bulk 1-in. x down, 25.90¢ per lb contained Cr plus 12.60¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, dump delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe.

Carloads	19.00
Ton lots	22.10
Less ton lots	23.60

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	20.00
Ton lots	22.30
Less ton lots	23.30

CMSZ

Contract price, cents per lb of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50.56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots	20.75
Less ton lots	22.00

SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

Ton lots	17.50
Less ton lots	19.50

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	16.50
Less ton lots	17.75

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	18.00
Ton lots to carload packed	19.00
Less ton lots	20.50

Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size.

F.o.b. Niagara Falls, Alloy, W. Va., Ashtabula, O.	$225
F.o.b. Johnstown, Pa.	$227
F.o.b. Sheridan, Pa.	$225
F.o.b. Etna, Clairton, Pa.	$228

Add $2.80 for each 1% above 82% Mn, subtract $2.80 for each 1% below 78% Mn.

Briquets—Cents per pound of briquet, delivered, 66% contained Mn.

Carload, bulk	12.45
Ton lots, packed	14.05

Spiegeleisen

Contract prices gross ton; lump, f.o.b.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Palmerton, Pa.	$84.00	$85.00
Pgh. or Chicago	84.00	85.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

96% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	36.95
Ton lots	38.45

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	30.00
Ton lots	32.00
Less ton lots	34.00 to 37.00

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	28.45	30.30	31.50
0.07% max. C	27.95	29.80	31.00
0.15% max. C	27.45	29.30	30.50
0.30% max. C	26.95	28.80	30.00
0.50% max. C	26.45	28.30	29.50
0.75% max. C, 80-85% Mn, 5.0-7.0% Si	23.45	25.30	26.50

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn ..... 21.35¢

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.

Carload bulk	11.40
Ton lots	13.05
Briquet, contract basis carlots, bulk delivered, per lb of briquet	12.65
Ton lots, packed	14.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $95.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00. Add $1.055 per ton for each additional 0.50% Si up to and including 17%. Add $1.00 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	18.00
97% Si, 1% Fe	18.50

Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 2 lb Si briquets.

Carloads, bulk	6.95
Ton lots	8.55

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.

25% Si	20.00	75% Si	14.30
50% Si	12.40	85% Si	15.55
90-95% Si			17.00

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Ferrovanadium

35-55% contract basis, delivered, per pound, contained V.

Openhearth	$3.00-$3.10
Crucible	3.10- 3.20
High speed steel (Primos)	3.20- 3.25

Alsifer, 20% Al, 40% Si, 40% Fe

contract basis, f.o.b. Suspension Bridge, N. Y.

Carloads	9.90
Ton lots	11.30

Calcium molybdate, 46.3-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.15

Ferrocolumbium, 50-60% 2 in. x D, contract basis, delivered per pound contained Cb.

Ton lots	$4.90
Less ton lots	4.95

Ferro-Tantalum-Columbium, 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta $3.75

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo $1.32

Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton $65.00

10 tons to less carload $75.00

Ferrotitanium, 40% regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50

Less ton lots 1.55

Ferrotitanium, 15 to 18%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $177.00

Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W5, ton lots, delivered $5.00

Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa. $1.14

bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.13

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound

Carload, bulk lump	14.50¢
Ton lots, bulk lump	15.75¢
Less ton lots, lump	16.25¢

Vanadium Pentoxide, 86-89% V_2O_5 contract basis, per pound contained V_2O_5 ..... $1.28

Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.

Ton lots	21.00¢

Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.

Carload, bulk	7.00¢

Boron Agents

Borosil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B, 3-4%, Si, 40-45%, per lb contained B $5.25

Bortam, f.o.b. Niagara Falls

Ton lots, per pound	45¢
Less ton lots, per pound	50¢

Corbortam, Ti, 15-21%, B, 1-2%, Si, 2-4%, Al, 1-2%, C, 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.

Ton lots, per pound	10.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots $1.20

F.o.b. Wash., Pa.; 100 lb up

10 to 14% B	.85
14 to 19% B	1.20
19% min. B	1.50

Grainal, f.o.b. Bridgeville, Pa. freight allowed, 100 lb and over.

No. 1	$1.00
No. 6	68¢
No. 79	50¢

Manganese - Boron, 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd

Ton lots	$1.46
Less ton lots	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered

Less ton lots	$1.30

Silcaz, contract basis, delivered.

Ton lots	45.00¢

The Clearing House

NEWS OF USED, REBUILT AND SURPLUS MACHINERY

Foreign Tools Cool—With backlogs and government orders dwindling, demand for foreign machine tools is dropping off in the Cleveland area. Used machinery dealers, who admit they have been hurt by imported tools, are breathing easier now.

From now on they say German, English, Italian and Swiss products will have to couple quality with quick delivery to maintain a foothold.

Another factor working against sales of imported tools is the ever growing number of inexperienced workers filling jobs in Cleveland manufacturing plants.

Use of less skilled workers as machine tool operators invariably means harder wear on the equipment. Dealers claim most of the foreign tools are too light to stand up under extended hard use.

Order Gap—Although some used machinery firms are still handling government orders, this source of demand continues to taper off rapidly. Dealers indicate the order gap is being filled fairly rapidly by demand from all types of metalworking plants.

However, dealers are still troubled by unbalanced inventories, shortage of skilled help, low profits on rebuilt machine tools and slow deliveries of spare parts.

Sales of some types of light equipment have slowed and demand for electric motors is dropping. But pressure is still on radial drills, turret lathes, good surface grinders, large vertical boring mills, slab millers and tool room equipment.

Make Their Own—Parts delivery is still not so dependable as rebuilders would like, but many of them have minimized the problem by making a lot of their own parts.

Building spare parts requires skilled help and, with the labor market still tightening, rebuilders have had to train their own men.

Most Cleveland dealers are predicting 1953 will be a good year for the used machinery industry. General consensus is that there will be a more favorable climate in Washington which, coupled with the possibility of decontrol, will pave the way to a free market.

Few Sugar Plums — Though Christmas stockings are still well stuffed, Chicago used machine tool men are finding the end of 1952 considerably less jolly than the same period last year.

Random estimates of business handled during 1952 indicate business has slumped as much as 25 pct from 1951 levels. Principal reason has been the cut in used machinery orders from manufacturers who, in 1951, were still tooling at a frantic pace to fill large defense contracts. This tooling-up stage is largely completed. And now for some parts of rearmament a stretchout will be superimposed on a stretchout.

Year End Lag — Consensus is that November sales were fewer than in October. This decrease is not due to any noticeable slip in manufacturing activity.

Main reason is that many dealers have eased their sales pressure as the end of the year approaches because from now on profits for a lot of dealers will just go for taxes.

Who's Who's—Machinery Dealers National Assn. is offering for sale a directory listing addresses of around 2400 dealers in new and used machine tools.

In addition, to U.S. dealers, firms in Canada and England are also included. The directory is arranged alphabetically by state, city and firm name. Cost of this valuable publication is $75.

Meanwhile OPS is uncertain over the fate of its price book. Many dealers are frankly disgusted over hemming and hawing of that agency. The book is still needed, but it's ironic that it may be published on the eve of the end of price controls.

CONSIDER GOOD USED EQUIPMENT FIRST

AIR COMPRESSORS
14" x 12" Pennsylvania Air Compressor, 100# Pressure. Complete with 75 H.P. Syn. Motor
18" & 11" x 14" Sullivan WJ-3 Air Compressor 885 CFM, Driven by 150 H.P. Westinghouse Syn. Motor 440/3/60

BAR TURNING MACHINE
Medart HF-2 Bar Turning Machine, Capacity 1" to 2½". Complete with Accessories

BENDER
Size 8&8 Parker Model CS Production Tube Bender. Capacity ⅛" to 3" O.D.

BENDING ROLLS
6'x¾" Ryerson Pyramid Type Bending Roll
12'x¾" Niles Bement Pond Pyramid Type Bending Roll
16'x9/16" Bertsch Bending Roll, Motor Driven
16'x1¼" Hilles & Jones Pyramid Type Bending Roll
20'x1" Southwark Pyramid Type Bending Roll
30'x1" Southwark Pyramid Type, Motor Driven

BRAKES—LEAF TYPE
8' x ¼" Dreis & Krump Leaf Type Bending Brake Motor Dr. with 40 H.P. A.C. Motor
12" x 3/16" Chicago #226 Steel Apron Brake, M.D.
16' x ⅜" Dreis & Krump Leaf Type Bending Brake Motor Dr. with 40 H.P. A.C. Motor

BRAKES—PRESS TYPE
14' All Steel Hydraulic Press Brake 500 Ton Cap. ⅛"

CHARGING MACHINE
6000 lb. Brosius Floor Type Gasoline Driven Charging Machine, Equipped with Peel, Buda Gasoline Engine, Rubber Tires

CRANES—GANTRY
5 ton Whiting Two Leg Gantry Crane 52' Span Cab Control Motors 220 v. 3 ph. 60 cy.

CRANE—LADLE
75 ton Morgan Ladle Crane 49'6" Span 4-Girder Construction, with 25 Ton Auxiliary, Complete with Motors for 230 Volt D.C.

CRANES—OVERHEAD ELECTRIC TRAVELING

5 ton Robbins Myers	28'6" Span 220/3/60
5 ton Bedford	52' Span 220/3/60 AC
7½ ton Shepard Niles	80' Span 440/3/60 AC
10 ton Whiting	34' Span
10 ton Whiting	57'10" Span
10 ton Shaw	67' Span 230 Volt D.C.
10 ton P&H	77' Span 230 Volt D.C. Equipt with 2 hooks spaced 11' apart
10 ton Erie	60' Span 440/3/60 AC
15 to Bedford	37'7" Span 220/3/60
15 ton Niles	60' Span 230 Volt D.C.
20 ton Bedford	50' Span 220/3/60
20 ton Morgan With 5 ton Auxiliary	68' Span 230 Volt DC
25 ton Morgan	47'10" Span 230 Volt DC
30 ton OET With 5 ton Auxiliary	48'7" Span 230 Volt DC
50 ton Whiting With 10 ton Auxiliary	80' Span

DIEING MACHINES
75 ton Henry & Wright High Speed Dieing Machine Double Roll Feed, Scrap Cutter, 3" Stroke
100 ton Henry & Wright Dieing Machine, 4" Stroke, 12" Shut Height, Complete Elecl. Equip.

DRAW BENCH
15,000 lb United Draw Bench, Length of tube to be drawn 31 ft. Motor Driven
50,000 lb. Draw Bench, Motor Driven with 50 H.P. Motor. Maximum Draw 40 ft.

FLANGING MACHINE
¾" McCabe Pneumatic Flanging Machine. Pneumatic Holddowns.

FORGING MACHINES
1½", 2", 3", 4", 5", 6" Ajax
1", 2", 3", 5" Acme
3 Ajax—Air Clutch

FURNACE—ANNEALING
Furnace Engr. Co. Bell Type Annealing Furnace Gas Fired Opting. Space 40"x40" Round. 500 CFM Cap

FURNACE—HEATING
NEW Oil Fired Surface Combustion Furnace Inside width 3', Length 13', Opening 8". 4840 lb per hour net work to 2200° F.
60 KW Leeds & Northrup Home Furnace #9478-UB-18. With controls. Work space 28" dia. x 28" deep

FURNACES—MELTING
400 lb. Moore Type "UT" Melting Furnace. Top Charge. Complete with Transformer. New 1948—Little Used
1000 lb. Model "U" Stroman Tilting Type Melting Furnace, Oil Fired
6000 lb. E.I.S. Nose Tilting Furnace. Complete with Transformer Equipment
15 ton Herault Model V-12 Top Charge Hydraulically Operated. Complete with Transformer Equip.

GEAR REDUCERS
500 H.P. United Combination Reduction Gear & Pinion Stand. Gear Ratio 8.581:1
600 H.P. Farrel Birmingham, Size 18 Reduction Gear, Ratio 720 to 244 RPM
700 H.P. Falk Single Reduction Rear, Ratio 875 to 200 RPM
1800 H.P. Mesta Gear Reduction Unit, Ratio 19:1

GRINDER
No. 4 Cincinnati Centerless Grinder, Motor Driven. Capacity standard work rest 2" to 6" dia., optional work rest ⅛" to 3". Special fixtures will allow work to be handled up to 9" dia.

GRINDER—CYLINDRICAL
14x36" Norton Type C. Complete with Elecl. Equip.

HAMMERS—BOARD DROP
1200, 1600, 2500 lb. Chambersburg
1000, 3000 lb. Billings & Spencer

HAMMER—COUNTER BLOW TYPE
35 ton Counter Blow Drop Forge Hammer. Steam or Air Operated

HAMMER—STEAM DROP
2000, 2500 lb. Chambersburg
1500 lb. Erie

HAMMERS—STEAM FORGING
1200 lb. Massillon Single Frame
1500, 1600, 2000, 3000, 4000, 6000 lb. Chambersburg
600, 1500, 2500 lb. N.B.F.
600, 1100, 1500, 2000, 2500, 3500, 4000 Erie

HAMMERS—MISCELLANEOUS
No. 6N Nasel Hammer, Geared Motor Drive
200 lb. Bradley Compact Hammer, Arr. for Motor Drive with 10 H.P. A.C. Motor
2000 lb. Chamberaburg Pneumatic Hammer Complete with Elecl. Equip. New 1951
15"x12" Chambersburg Cecostamp Hammer, 18" stroke

LATHE—TURRET
Model 2L Gisholt Geared Head Turret Lathe, Spindle Bore 4-1/16". Elecl. Equipment and numerous accessories incl. NEW 1951

LEVELER—ROLLER
60" Aetna Standard 17-Roll Leveler, 4⅝", Dia. Rolls Arr. Motor Drive

MOTORS
1250 H.P. Westinghouse Induction Motor 6600 volt 3 phase 60 cycle 593 R.P.M.
2000 H.P. General Elec. Induction Motor 6600 volt 3 phase 60 cycle 600 R.P.M.
2500 H.P. General Elec. Direct Current Motor 6600 volt 175/350 R.P.M.

MOTOR GENERATOR SET
740 H.P. General Electric Syn. Motor 4400 volt A.C. with two generators 750 KVA 230 volt D.C., Complete with Panel Board, etc.

NAIL MAKING MACHINES
No. 1½ National—Sizes 10D, 12D, 16D, 20D, 30D
No. 3 National—Size 6D
No. 2—Glader—Sizes 6D, 7D, 8D, 9D
Angell—Sizes 10D, 12D, 16D, roofing

PRESSES—EXTRUSION
700 ton Horizontal Extrusion Press, 3-Column Type Ram 26" Diameter, Container suitable for billets 5" x 20"
1300 ton Horizontal Extrusion Press, 3-Column Type Ram 34" Diameter, Suitable for billets 6" dia. x 22" long

PRESSES—HYDRAULIC
Model BL-350 Milwaukee Hydraulic Briquetting Press Complete with Pumps. Capacity Grey Iron Briquettes 3½ tons per hr.
300 ton Bliss Hydrodynamic 48" Stroke Bed Area 24" x 24", Hyd. Pump Incl.
500 ton Southwark, 20" Stroke, Distance Between Columns 30" x 144"
500 ton Southwark Hydraulic 24" Stroke, 78" Daylight Platen 64" R to L x 32" F to B
500 ton Southwark Open Throat Hydraulic Press 12" Stroke Platen 56" x 56"
700 ton Elmes Forming Press, 27" Stroke, 36" Dia. Ram, Platen 40" x 88" with overhang 40" x 120". Complete with Pump and Motor

PRESS—HYDRAULIC WHEEL
100 ton Elmes Inclined Hydr. Wheel Press 72" Between Parallel Bars. Complete with Pump and Motor

PRESS—KNUCKLE JOINT
#27 Bliss Knuckle Joint Embossing & Coining Press 1000 ton Capacity, 2½" Stroke, 18" Shut Height

PRESSES—STRAIGHT SIDE
No. 305 Bliss 9" Stroke 14" Shut Height Equipped with Marquette Air Cushion
No. 59 Toledo Double Geared Tie Rod Press 255 ton Friction Clutch 18" Stroke 36¼" x 35" Bed Area
No. 3 Ferracute Super Speed Punch Press 30 ton Capacity. NEW 1946—never used
No. 620 Bliss High Production Press, 1½" Stroke
SI-40 Verson 200 ton Press, 30" Stroke, Bed Area 40" x 44"
No. 12 Zeh & Hahnemann Patent Percussion Press 150 ton 12" Stroke, 17" x 17" Bed Area
No. 1037-¾ Hamilton 300 Ton 16" Stroke, Bed Area 48" x 104"

PRESS—TOGGLE DRAWING
No. 410A Bliss 650 Ton Double Crank Strokes 28" & 17" Bed Area 60" x 84"

PRESSES—TRIMMING
Bliss S.S. Trimming Press with Side Shear, 250 Ton Capacity, 5" Stroke 52" x 30" Bed Area
No. 3 Erie Flywheel Drive Trimming Press, 3¾" Stroke 13" Between Guides
1500 ton Hydraulic Bending & Trimming Press. Distance between columns 86" x 86"
2500 ton Hydraulic Bending & Trimming Press. Distance between columns 90" x 108"

PUNCH & SHEAR COMBINATIONS
No. 28 U-30 Buffalo Armor Plate Universal Ironworker, Capacity Punch 1⅛" thru 1¼", Shear 3" Round 3⅝" Square, 5 x 1⅝" Flat, 5 x 5⅝" Angles
Style EF Cleveland Single End Punch & Shear, M.D. Capacity Punch 1" thru 1¼"
Wickes Single End Punch & Shear, 48" Throat Capacity Punch 2½" thru 1½", Motor Driven

ROLL—PLATE STRAIGHTENING
7 Roll Bertsch Plate Straightening Machine, Capacity 10' x ⅜" Complete Elecl. Equip.

ROLLING MILLS
7½" Steckel Four High Rolling Mill, Max. Steel Width 6", Work Rolls 2½" x 7½", Complete with electrical equipment
8"x10" Schmitz Single Stand Two High
12"x16" Single Stand Two High, Comp. with Elecl. Equip.
12"x24" Waterbury Farrel Two High
15"x30" Mossberg Single Stand Two High
18"x24" Waterbury Farrel Two Stand Two High
20"x30" Two Stand Two High Rolling Mill
20"x36" Poole Two Stand Two High
22"x40" Single Stand Two High
27"x56" United Two High Skin-pass Mill
28"x60" Single Stand Two High
18"x60" Three High Roughing Mill, Complete with billet heating furnace and accessory equipment incl. elecl. equip.

SAWS
No. 749 Espen-Lucas Heavy Duty Cold Saw. Capacity up to and incl. cakes or slabs 48" x 7" Stroke 73". Motor Driven
No. 3 Ryerson Friction Saw, 84" Blade Hydraulic Feed, Complete with Elecl. Equip.
52" Ryerson Friction Saw, 45 H.P. Motor, Capacity Approx. 9" Round, 20" I-beam, 12" H-beam

SHEAR—ALLIGATOR
No. 7 Thomas Carlin Alligator Shear, 16" Blade. 30 H.P., D.C. Motor

SHEARS—ANGLE
Hilles & Jones No. 2 Double Angle Shear, M.D. Capacity 6" x 6" x ⅞"
Long & Allstatter Double Angle Shear, Model B. Capacity 6x6x⅞". Complete with Elecl. Equip.

SHEAR—BAR
No. LH Lewis Open End Bar Shear, Motor Drive. Capacity 1¼" Round

SHEAR—BILLET
Pels Billet Shear, Belted Motor Drive. Capacity Cold 8¾" Round, 8" Square

SHEAR—MISCELLANEOUS
United Oil Hydraulic Up-Cut Shear Complete with Pump, Motor and Tank. 36" Knives, 8" Stroke, Pressure Between Knives 360,000# at oil pressure of 2000# per sq. in.

SHEARS—ROTARY
No. 60 Quickwork Rotary Shear, ⅝" Capacity
No. 100 Kling Rotary Shear, 1" Capacity
No. 30 Quickwork Rotary Shear 5/16" Capacity
Quickwork Heavy Duty Circle Shear ⅜" Capacity Complete with Circle Cutting Attachment
No. 25A Quickwork Whiting Rotary Shear ¼" Capacity, with Circle Cutting Attachment, Motor Driven

SHEARS—SQUARING
12'x3/16" Stamco Steel Squaring Shear, Motor Dr.
6'x¼" Long & Allstatter, Belted Motor Drive

SLITTERS
18" Slitter, Motor Driven, Complete with Expanded Pay-Off Reel and Recoiler
24" Torrington Heavy Duty Slitter, Capacity 5 cuts ⅜" mild steel
31" Yoder Sheet Slitter No. 530, Capacity 3 cuts .194" to 8 cuts .156". Motor Dr.
72" Yoder Gang Slitter, Capacity 5 cuts 20 Ga.

SLITTING LINE
76" Mesta Slitter, Complete with Mesta Feed Reel Mesta Uncoiler and Elecl. Equip.

STRAIGHTENERS
No. 3 Medart 3-Roll Straightening Machine Capacity 1" to 3½" bars or 4¼" O.D. Pipe or Tubing NEW 1950
No. 1½B Sutton Round Straightener, Motor Dr. Capacity Tubing 5/16" to 3¼"—modified to handle up to 3½" O.D. tubing.
No. 1B Sutton Round Straightener, Motor Drive Capacity 3/16" to ⅞" O.D. Friction Drive complete with 1/3 H.P. A.C. Motor
Hallden 8-Roll Strip Straightener & Cutting Machine, Capacity 16" wide 11 Ga. Sheet Steel

STRETCHER
McKay Hydraulic Bar Stretcher, Capacity up to 1¾" dia. in length 12' to 27'

SWAGING MACHINES
No. E4 Langelier, Capacity 1½" Tubing
No. 408 Etna Swager, Capacity 4" Tubing

TESTING MACHINES
300,000# Southwark Emery Universal Hydraulic

THREAD ROLLER
Model "C" Watson Flagg Precision Thread Roller Capacity up to 3", Incl. Accessories & Electrical Equipment

WELDERS
250 KVA Progressive Model A-6 Flash Welder 440 volt 60 cycle. Mechanical Contactor Hi-Pressure Clamp Assembly—NEW 1949
40,000# Ransome Welding Positioner. Rectangular Table 84" x 84" x 1⅜"
McKay Tube or Pipe Welding Unit, Capacity 4⅝" to 7½" O.D. Complete with all accessory equipment and motors

WIRE DRAWING MACHINE
No. 0 Waterbury Farrel 7-Die Wire Drawing Machine Capacity ¼" rod to #10 copper

THE CLEARING HOUSE

RE-NU-BILT GUARANTEED ELECTRIC POWER EQUIPMENT

D.C. MOTORS

Qu.	H.P.	Make	Type	Volts	RPM
1	2200	G.E.	MCF	600	400/500
1	1750	Whse.		600	550/700
1	1500	Whse.		525	600
1	940	Whse.	QM	250	140/170
1	600	Al. Ch.		250	400/800
1	500	Whse.	CC-216	600	300/900
2	450	Whse.		550	415
1	400	G.E.	MCF	550	300/1050
1	350	Cr. Wh.	CCM-151H	230	1100
1	335	Whse.	MQ	250	300/900
1	300/300	G.E.	MPC	230	360/920
1	200	Rel.	1970T	230	720
1	150	G.E.		600	250/750
1	134	Rel.	1400T	230	400/1200
1	150	Cr. Wh.	85H	230	1150
10	150	Cr. Wh.	83H-TEFC	230	960
2	150	Whse.	BK151B	230	900/1800
1	150	Whse.	BK-201	230	340/950
1	50/120	G.E.	MCF	230	250/1000
2	100	Whse.	BK-181	230	450/1000
1	100	G.E.	CDP-115	230	1750

MILL & CRANE

1	50	G.E.	CO-1810	230	725
1	33	Whse.	K-8	230	505
2	30	G.E.	MD-104½AA	550	700
1	20	Whse.	K-5	230	975
4	15	Whse.	K-5	230	850
8	10	C.W.	SCM-AH	230	1150
1	10	G.E.	MD-104	230	400/800
8	6.25	Whse.	K-3	230	680
4	3	C.W.	SCM-FF	230	1750
2	3	Whse.	HK-2	230	825
1	1½	Whse.	K-1	230	835

A.C. MOTORS

3 phase—60 cycle

SLIP RING

Qu.	H.P.	Make	Type	Volts	Speed
1	1800	G.E.	MT-498	2300	360
1	1500	ABB		2300	720
1	1200	G.E.	MP	2300	375
1	500	Whse.	CW	550	850
1	500	G.E.	IM	440	900
3	500	G.E.	M-574-Y	6600	900
1	500	G.E.	IP	550	505
1	400	Whse.	CW	440	514
1	350	G.E.	MT-442Y	2300/4000	253
1	300	Al. Ch.		440	505
1	250	G.E.	MT-434-Y	4000	257
1	250	G.E.	MT-559S	2300	1800
1	250	Al. Ch.		550	900
1	200	Cr. Wh.	26QB	440	505
2	200	G.E.	IM17	550	585
8	200	G.E.	IM-17	440	900
1	200	G.E.	IM	440	435
1	300	G.E.	MTP	440	1170
1	150(unused)	Whse.	CW	2300	435
1	135	Al. Ch.		440	720
4	125	G.E.	MT-566Y	440/2300	435
3	100	G.E.	IM	440	900
5	100	A.C.	ANY	440	695
1	100	G.E.	IM-16	2300	435
1	100	Whse.	CW-868A	440	700

SQUIRREL CAGE

3	650	G.E.	FT-550BY	440	3570
3	450	Whse.	CR-1420	2300/4150	854
1	300	Al. Ch.		2300	385
1	300	G.E.	IK-17	440	580
1	250	G.E.	IK	440	865
2	200	G.E.	KT-557	440	1800
1	150	Whse.	CR-8568	440	880
1	150	Whse.	CR	440	580
1	150/75	G.E.	IK	440	900/450
3	125	Al. Ch.	ARW	2300	1730
1	125	G.E.	KF-6328-Z	440/2300	3585
1	125	Whse.	MS	440	485

SYNCHRONOUS

2	3500	G.E.	TS	2300	257
3	2100	G.E.	ATI	2300	300
2	1750	G.E.	ATI	2300	3600
2	2000	Whse.		2300	120
3	735	G.E.	ATI	2300/12000	600
1	450	Whse.		2300	450
3	350	G.E.	TS	2300	156

M-G Sets — 3 Ph. 60 Cy.

Qu.	K.W.	Make	RPM	D.C. Volts	A.C. Volts
2	2000	G.E.	500	600	11000*
1	2000	G.E.	514	600	6600/13200
2	1500	G.E.	514	250	6600/13200
1	1500	G.E.	720	600	6600/13200
3	1500	G.E.	900	275	4400
2	1500	G.E.	600	600	4160
1	1000	Whse.	900	600	4160
1	1000	G.E.	900	300	6600
1	1000(3U)	G.E.	900	250	2200
1	750	Whse.	900	375	4160
1	500	G.E.	720	125	2300
1	500	Whse.	900	135/250	440
1	500	Whse.	900	250	6600/13200
1	500	Whse.	1200	135/250	2300
1	400	Whse.	1200	250	2300
1	400(3U)	Cr. Wh.	1200	135/250	2300
1	250	G.E.	900	125	2300/4160
1	200	Al. Ch.	1200	125/250	2300
1	150	Whse.	1200	275	2300
1	140(3U)	Cr. Wh.	690	125/250	440/2300
1	100	Delco	1200	120/240	2300
1	100	G.E.	1170	125	220/440

* 25 Cycle

FREQUENCY CHANGER SETS

Qu.	KW	Make	Freq.	Voltages
1	3000	G.E.	25/60	2300/2300/4000
2	2500	G.E.	25/62.5	2300/2300
1	1000	G.E.	25/58.3	4400/2300
1	500	Al. Ch.	2500	11000/2300

BELYEA COMPANY, INC.

47 Howell Street, Jersey City 6, N. J.

MILES' QUALITY

AIR COMPRESSOR, 21"x13"x16" Worthington
AUTOMATIC, 20"x25" Fay (1942)
AUTOMATIC, 8" Bullard Mult-Au-Matic, 6-spindle
AUTOMATIC, 6-spindle Baird chucker
AUTOMATIC, 3¼" x 3¾" Cleveland "A"
BORING MILL, 4" Detrick & Harvey, horiz. floor type
BRAKE, 8' Cincinnati, 65 ton, press
BROACH, No. 1 Foote Burt duplex surface
BROACH, 12 ton No. V2 American Vertical
BROACH, 15 ton H1048 American horizontal, 1946
BROACH, No. 3XA Oilgear horizontal hydraulic
BROACH, V42 American hydraulic, 18 ton
BULLDOZER, No. 22 Williams & White
DRILL, Nos. 217, 310, 321 Baker
DRILL, No. 36 HO Baker hydraulic
DRILL, 21" & 24" Cincinnati, upright
DRILL, 12-spindle No. 12 Natco
DRILL, 12-spindle No. 10 Defiance rail type
DRILL, No. B 250 H Natco multiple
DRILL, 36-spindle Baush, adjustable spindle
DRILL, RADIAL, 3' Dreses Simplex
DRILL, RADIAL, 3½', 8" American sensitive
GEAR HOBBER, 72" Westinghouse
GEAR HOBBER, No. 12H G&E
GEAR HOBBER, No. 130 Cleveland Rigidhobber
GEAR HOBBER, No. 3 Adams Farwell
GEAR HOBBERS, No. 12 Barber Colman
GEAR HOBBERS, type A Barber Colman, 1944
GEAR HOBBERS, Nos. 1 and 25 5A Lees Bradner
GEAR SHAPER, No. 7 Fellows
GEAR SHAVER, 12" Red Ring, 1946
GEAR TESTER, No. 13 Gleason
GRINDERS, CENTERLESS, Two No. 2 Cincinnati
GRINDER, 4H Landis Cylindrical, 1944
GRINDERS, 10"x18" & 10"x36" Norton Semi-Auto
GRINDER, DISC. 30", No. 8 Badger
GRINDER, DISC. No. 228 Hanchsett opposed
GRINDER, GEAR, 10" Pratt & Whitney
GRINDER, Internal. Bryant Nos. 5, 16A, 16-28 & 24-36
GRINDERS, INTERNAL, Nos. 72A3 and 72A5 Heald
GRINDERS, SURFACE, 12" and 16" No. 2 Healds
GRINDER, SURFACE, No. 78 Wilmarth & Morman
HAMMER, Nos. 5N & 6B Nazel pneumatic
HAMMER, 40 lb. Bradley helve
HONE, Nos. 172 & 2610 Barnes hydraulic
LATHE, ENGINE, 24"x14' American
LATHE, TURRET, No. 5 Acme universal
LATHE, TURRET, No. 5 Gisholt universal, 1943
LATHE, TURRET, No. 6 W&S, G, H, motor-in-base
LATHE, TURRET, 36" Rogers vertical
MILLERS, Two No. 2 Cincinnati plain
MILLER, 18" Cincinnati automatic
MILLER, 24" Cincinnati automatic duplex
MILLER, type 45 Product-O-Matic
MILLER, 30½" x 21" x 12" Ingersoll 4-spindle planer type
MILLER, 48" x 20" x 20' Ingersoll planer type, 3 vertical heads
MILLER, 48" x 36" x 12' Ingersoll planer type adj. rail
MILLER, 84" Ingersoll 6-spindle rotary continuous
MILLER, PLAIN, No. 3B Milwaukee
MILLER THREAD, Type C Hall planetary
MILLER, THREAD, Nos. 4, 6 and CT 36 Lees Bradner
NIBBLER, No. 3 Savage rotary
PLANER, 36"x36"x12' Niles Bement Pond
PRESS, No. 61 Cleveland OBI
PRESSES, Nos. 56 & 56½ Toledo
PRESSES, Nos. 93½C & 94½E Toledo, dbl. cr., s.s.
PRESS, No. 245½ Hamilton s.s. tiered frame
PRESS, No. EG54 Ferracute knuckle joint
PRESS, 600 ton No. 570 Toledo forging
PRESS, No. DA8411 Hamilton double action toggle
PRESS, 100 ton HPM hydraulic
RIVETERS, large variety
ROLL, 20'x3/16" Farnham bending
SLOTTER, 16" Bement Miles crank
SAWS, Three 816S Kalamazoo metal cutting band
SAW, 7" No. 14 Higley cold-cutting
SHAPER, 24" American auto, oiled
SHAPER, 27" Morton draw cut
SHEAR, 38" throat No. 17F New Duty
STRAIGHTENER, No. 0 Sutton for bars
SWAGER, No. 154 Etna
TAPPERS, Two No. 71 Ettco
TESTER, 230,000 inch-pound Tinius-Olsen No. 2 torsion
TESTER, 100,000 lb. Riehle tensile & compression
THREADERS, 2" Landis pipe threading and cutting
THREADERS, Two ¾" Landis, double spindle
THREADERS, 2" Oster rotary head
UPSETTER, 3" National air clutch
UPSETTERS, Two 4" Ajax heavy duty, twin-gear
WELDER, 100 KVA Thompson automatic spot
WELDER, 100 KVA National Flash

WRITE FOR CATALOG NO. 195 FOR COMPLETE LISTING

MILES MACHINERY CO.

2025 E. Genesee Ave.
SAGINAW, MICHIGAN

CIMCO MACHINE TOOLS AT BARGAIN PRICES

Giddings & Lewis 4" bar boring mill
King 42" Vertical Boring Mill, 2 heads
Niles 36-44 Vertical Boring Mill, motor driven, 1 rail and 1 side head
Cincinnati #3 Vertical Mill, single pulley drive
Niles 42"-50" Burnisher, Facer and Box Borer, late type, motorized
Cincinnati-Bickford 4'11" column Radial gear box on base.
Fosdick 6'15" Radial Drill
Fellows 612 Spur Gear Shaper
Fellows 725 Gear Shaper with Spur Guide
Cincinnati 24" Back Geared Shaper
Columbia 28" Back Geared Crank Shaper
Gould & Eberhardt 16" Back Geared Shaper
Gould & Eberhardt 24" Back Geared Shaper
Gould & Eberhardt 28" Back Geared Crank Shaper
Gould & Eberhardt 32" Back Geared Crank Shaper
Gould & Eberhardt 96H Gear Hobber
Gould & Eberhardt 18-H Hobber
Gould & Eberhardt 60BM Gear Rougher
Cincinnati #2 Centerless Grinder
Fitchburg 48" Spline Grinder, late
Heald #50 Internal Grinder
Heald #72A3 Internal Plain Grinder
Heald 70A Internal Grinder, late type
Heald 78 Centerless, Internal & Cylindrical Grinder
Jones & Lamson 8 x 31 Thread Grinder
Landis 26" x 168" Plain Cylindrical Grinder
Landis Type C Plain Grinder, 10 x 18, late type
Landis 16" x 72 Plain Cylindrical Grinder
Oliver Template Tool Bit Grinder
Sellers 4T Tool Grinder, late type
Sellers 6T Tool Grinder, late type
Hanchett No. 600 — 86" UK Traveling Wheel Face Grinder, 100 HP grinding wheel motor, table 86" long x 72" wide, new 1946.
Acme #2 Full Universal Turret Lathe 3¼" hole in spindle
Gisholt 1L Saddle Type Turret Lathe, complete with bar feed, late type
Oster 601 Rapiduction Turret Lathe
Blount Model B-3 Special Application Lathe for turning, chucking, polishing and lapping
Lodge & Shipley, 16" x 126" centers, Timken bearing, late type, complete with taper attachment
Lodge & Shipley, 16" x 6' G.H. Lathe, 12 speeds
Lodge & Shipley 18" x 6' G.H. Lathe, 12 speeds
Lodge & Shipley 20" x 8' G.H. Lathe, 12 speeds
American 30" x 14' G.H. Lathe, taper
Monarch 24" x 12' G.H. Lathe, taper
American 36" x 40' G.H. Internal Face Plate Drive, 18 speeds, 33' center distance, taper attachment
Brown & Sharpe #3 Plain Miller 4 SCD
Brown & Sharpe 4B Heavy Plain Miller, single pulley drive
Hall Style "D" Planetary Miller, late type
Pond 42 x 42 x 10' Double Housing Planer, DC motor drive, 4 heads
Pond 48 x 48 x 16' Double Housing Planer, DC motor drive, 4 heads
Bliss #37 Coining Press, ¾" stroke, 150 ton
Baker 217 Drill Press
Rasmussen 6 x 6 Power Rack Saw

GUARANTEED MACHINERY

This Is A Partial List Of Our Stock. Send Us Your Inquiries.

CINCINNATI MACHINERY COMPANY, INCORPORATED
209 E. Second Street
CINCINNATI 2, OHIO

6' American Radial Drill—Serial #55582
#81A Fellows Gear Shaper—Serial #21252
#3 Gisholt Turret Lathe—Serial #2807-1
16" Gould & Eberhardt Shaper
60" Hanchett Face Grinder
Lodge & Shipley Lathe—Serial #2905I
#2 Norton Tool & Cutter Grinder—Serial #3385
6D Potter & Johnston Automatic Chucker—Serial #70353
72" King Heavy Duty Vertical Boring Mill Serial No. Let 38—#175
Rowbottom Cam Miller—Serial 135/49. Rebuilt & guaranteed
20" Knight Rotary Table
Rebuilt No. D-8 Colburn Heavy Duty Drill Press—Serial #155
Rebuilt No. 314 Baker 24" Heavy Duty Drill Press—Serial #2-4596
Defiance 3¼" Table Type Horizontal Boring Mill—Serial #870-38

Hazard Brownell Machine Tools, Inc.
350 Waterman St. Providence 6, R. I.

30" x 42" UNIVERSAL PLATE MILL, 3-HIGH

Capacity to roll Universal Plates from 8" minimum to 44" maximum width. When used as rougher for continuous hot strip mill, has rolled 1900 tons in 8 hours, starting with slabs 8" thick and going down to .90" thick.

Consists of:

1—3-HIGH ROLL STAND with top and bottom rolls 30" diam., middle roll 21" diam., all 65" face. 22" diam. vertical rolls.

1—SPECIAL PINION STAND.

—FRONT AND BACK TILTING TABLES.

1—APPROACH TABLE.

Further Details Upon Request

FRANK B. FOSTER, INC.

2220 Oliver Building, Pittsburgh 22, Pa.

Cable: "Foster Pittsburgh" **Telephone ATlantic 1-2780**

GUARANTEED TOOLS

16"x78" SIDNEY Toolroom Lathe, chuck, taper, new 1947

60"x20' NILES-BEMENT-POND Geared Head Engine Lathe, rapid traverse

27"x12' MONARCH Geared Head Engine Lathe, taper attachment, AC-MD

24"x72" centers BOYE & EMMES Heavy Geared Head Engine, chuck, AC-MD

No. 2B FOSTER Geared Head Turret Lathe, rapid traverse, AC motors

No. 3L GISHOLT Turret Lathe, 6¼" hole in spindle, bar feed, chuck, tooling, new 1945

42" BULLARD New Era Type Vertical Turret Lathe, AC-MD

36" BULLARD Vertical Turret Lathe converted to Spiral Drive, AC-MD

1½" LANDIS Double Head Bolt Threader, with leadscrews, MD

No. 1 DOUGLAS Plain Horizontal Mill, table 8"x32", power feeds, motor in base, No. 40 taper, new 1942

No. 2 VAN NORMAN Plain Horizontal Mill, power rapid traverse, No. 50 taper, new 1942

No. 3-24 CINCINNATI Plain Hydromatic Mill

5-13" column CARLTON Radial Drill AC motor on arm, 15 to 1500 RPM

4' AMERICAN High Speed Sensitive Radial Drill 9" column, AC motor on arm

No. 914 W. F. & John BARNES Hydraulic Drill, No. 6 Morse taper, 15HP motor, new 1948

3 Spindle FOSDICK Drill Press, individual AC motors for each spindle, 1942

No. 6 TOLEDO O.B.I. Press, 56 Tons

Brand New Model FH-4C01 DENNISON Hydraulic Presses, 4 Ton, 8" throat (3)

10"x24" NORTON Hydraulic Surface Grinder, 1942

25A HEALD Rotary Surface Grinder, 24" diameter, magnetic chuck

36" OHIO Dreadnaught Shaper, AC-MD

75 Ton HENRY & WRIGHT Double Crank Dieing Machine, roll feed & Scrap cutter

No. 22 MURCHEY Threader

No. 135 CLEVELAND Rigidhobbers

O'CONNELL MACHINERY CO.

Tel: BAiley 5800

1693 GENESEE ST. BUFFALO 11, N.Y.

WORLD'S LARGEST STOCK

STAMPING PRESSES

BLISS • CLEARING • CLEVELAND
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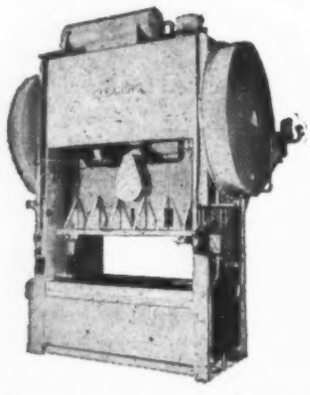

SQUARING SHEARS • PRESS BRAKES

REBUILT *and* GUARANTEED

JOSEPH HYMAN & SONS

TIOGA, LIVINGSTON & ALMOND STS.

PHILADELPHIA 34, PA. Phone REGENT 9-7727

BORING MILL—84" (New)
BORING MILL—200" (New)
DRILLS, Radial—4', 5', 6', up (New)
FURNACE (2)—Tocco, Jr. 20KW, 2 Sta.
FURNACE—Roller Hearth, I.D. 15'8" x 3'6" x 11"
GRINDER—Rotary, 84" diam.
GUN BORING LATHE—64" x 65'0"
LATHE—32" x 21' c/c Bridgeford G.H.
MILLER VERT.—28" x 72" and 36" x 118" (New)
PRESS—2000 Ton, Knuckle Joint
PRESS—Plate Bending, 2000 Ton for forming cyl. shells, 14' W x 2½" Thick
PRESSES—Hydraulic, 1000-4000 Tons
PRESSES—Hyd. 100-2800 Tons for 105 mm shells
RIVET HAMMER—6B Hi-Speed
STRAIGHTENING PRESS—2000 Tons (Plate)
NUT-TAPPERS—¾", 6 Spindles (2)

MAXWELL MACHINERY CORP.

1775 Broadway New York 19, N. Y.

Plaza 7-3471

No. 2 B & S High Speed Autos. M.D.
Gleason Nos. 7 & 12 Cutter Grinders.
No. 6A Thomas O.B.I. Press, M.D. 1947.
P&W 30" 2-spindle Vertical Profiler.

D. E. DONY MACHINERY CO.

47 Laurelton Road Rochester 9, N. Y.

1—500 HP, Gear Drive consisting of the following: motor, 500 HP, G.E., 3 phase 60 cycle, 440 volt, with controls; Gear Reducer, Farrel-Birmingham 500 HP, 860 RPM to 165/2.5 with speed changer.

1—2500 HP, G.E. 600 volt DC Motor, 200/400 RPM.

1—400 HP, G.E. Motor, 3/60/440 volt, 3 bearing unit, type I, form M, 514 RPM, 2 bracket.

1—Gear Reducer, Birmingham, 600 HP, ratio 720 to 244 RPM, Like NEW.

Lou F. Kinderman

Box 182 - Niles, Ohio - Phone 29876

***FERRACUTE** double sided, double geared, knuckle joint embossing and forming presses:-*

Model E.57. Pressure 1300 tons. Stroke 2½". Between uprights 36". Weight 45 tons.

Model E.56. Pressure 900 tons. Stroke 1¾". Between uprights 30". Weight 35 tons.

Model E.55. Pressure 500 tons. Stroke 1½". Between uprights 30". Weight 22 tons.

F. J. Edwards Limited

359-61 Euston Road, London N.W.1, England

Cables: Bescotools London

IMMEDIATE DELIVERY FROM STOCK

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★ 2⅝" CONOMATIC, 6 Spdl., Ser. 2891 SE and 3464 SE, chip conveyor, threading spindle (2)
★ 1⅝" RA8 ACME GRIDLEY, 8 Spdl., Ser. 85013, threading spindle
★ 1⅝" RA6 ACME GRIDLEY, 6 Spdl., Serial 40603, threading spindle, chip conveyor
★ 1" RA6 ACME GRIDLEY, 6 Spdl., Ser. 23455, chip conveyor, threading spindle (2)
★ 9/16" RA6 ACME GRIDLEY, 6 Spdl., Ser. 22965A, No. 22700 AM, chip conveyor (2)
No. 676 NEW BRITAIN CHUCKER, 6 Spdl., Ser. 23003, with chucks
2⅝" MODEL F ACME GRIDLEY, 4 Spdl., Ser. 7769 stock stand reel
1¾" CONE, 4 Spdl., Ser. 33, stock stand, reel
#00 and #2 BROWN & SHARPE, front and rear tool slides

BROACHES

★ AMERICAN, 6 Ton, 24" stroke, Vertical, Serial #4463, 3 Way, Push, Pull and Surface
★ AMERICAN 8 Ton, 24" stroke, Vertical, Serial #2684, 3 Way, Push, Pull and Surface
FOOTEBURT, 3 Ton, 40" stroke, Vertical, Dual Ram
★ LAPOINTE, 7½ Ton, 24" stroke, Model HP, Horizontal

DRILL PRESSES

★ SNYDER Sgl. Spdl., No. 3 M.T., Dial Type, Powerfeed
★ BARNES H-3 Sgl., Hydram, Vertical
★ No. 288 EDLUND Sgl. Spdl., No. 2 M.T., NEW

GEAR MACHINERY

★ #5B FARREL SYKES Herringbone Gear Generator, 61" dia., 1942 Machine
#2A FARREL SYKES Herringbone Gear Generator, 26" dia.
★ #140 CLEVELAND Rigidhobber, 1945 Machine
★ #7125A FELLOWS Gear Shaper, Late
★ #12 FELLOWS Gear Shaver, Late
★ #15 and #25 GLEASON Gear Quenching Press

GRINDERS

★ No. A1-12 ARTER Rotary Surface, Serial #1506, with 12" Mag. Chuck
14 x 30, 17 x 42, and 17 x 48 NORTON Crankshaft, with Pot-Type Chucks
#81 HEALD Internal
#72A3 HEALD Internal
★ #112 RIVETT Internal

LATHES

★ 18" x 60" cc MEUSER Toolroom New
★ 10 x 24" JACKSON MELLING Crankshaft Turning
★ 10 x 32" ATLAS, with chuck and gears
★ 11 x 30" SEBASTIAN, Chuck and face plate
★ R-14 SENECA FALLS, Lo-Swing, 16½" swing
★ Gisholt SIMPLIMATIC, Air Operated Chuck and Air Cylinder, 34" swing over ways

PRESSES

#2ET-10-86 BLISS Triple Action Toggle, Capacity of Plunger 650 Ton, Blankholder 400 Ton, Lower Ram 350 Ton, Bed area 62 x 86, 39" Stroke of Plunger, 28" of blankholder
#410A BLISS Double Action Toggle, Capacity of Plunger 525 Ton, Blankholder 290 Ton, Bed area 60 x 84, 25" stroke of drawing slide, 17" of blankholder slide, D.B.G.
#794 ½B TOLEDO Double Action Toggle, Capacity of Plunger 200 Ton, Blankholder 120 Ton, Bed area 45 x 72", 18" stroke of drawing slide, 12" stroke of blankholder D.B.G.
#96-D TOLEDO, Double Crank, S.S., 255 Ton, 6" stroke, 30" shut height, 51 x 87" bed area
★ 65, 55 and 38 ton WALSH O.B.I., NEW, Immediate delivery
50 Ton, HENRY & WRIGHT Dieing, with Double Roll Feed, scrap cutter

MISCELLANEOUS

★ McKAY ROLLER LEVELLER, ½" to 2" 4-High, 15" dia. rolls x 72" wide (2)
No. 10M2 TISHKEN ROLL FORMER, 10 stand, with AUTOMATIC CUTOFF
★ No. 1 BAKEWELL TAPPER, Serial #712
★ No. 2G MOREY, Serial #T803, with 3 Jaw Chuck, Cross slide
★ No. 1 WARNER & SWASEY, Serial 582809, ⅝" Capacity, Bar Feed
★ ¼" GRAHAM Stud, 1951 Machines (2)

PAUL'S MACHINERY COMPANY
6111 VERMONT, DETROIT 8, MICHIGAN **TYler 76300**

Eastern Rebuilt Machine Tools

THE SIGN OF QUALITY—THE MARK OF DEPENDABILITY

GEAR GRINDING MACHINES

6x20" Fitchburg Hydraulic Spline & Gear Grinder, m.d.
9" Pratt & Whitney Hydraulic Spur, m.d.
10" Pratt & Whitney Hydraulic Spur & Helical
No. 13LS Fellows Gear Lapper, m.d.
SG11 Gear Grinding Machine, m.d.,latest

GEAR HOBBING MACHINES

No. 12 Barber-Colman, single overarm, m.d.
No. 34 Brown & Sharpe, m.d.
No. 44 Brown & Sharpe, m.d., Spur & Spiral
Pfauter Gear Hobber, Model RS 1, m.d., new

GEAR CUTTERS

No. 50 Cross Gear Chamfering Machine, m.d.
Gleason Spiral Bevel Gear Rougher, m.d.
3" Gleason Straight Bevel, m.d.
8" Gleason Straight Bevel, m.d.
11" Gleason Straight Bevel, m.d.
Cincinnati Gear Burnisher, m.d.

GEAR TESTERS

Michigan Gear & Hob Checker, No. 471, late
No. 1 Brown & Sharpe Spur Gear Tester
12" cap. National Broach & Machine Co.
18" National Broach & Machine Co.

AUTOMOTIVE GRINDERS

Kwik-Way Model H Piston Turning & Grinding Machine, m.d., late
No. 76 Van Norman Automatic Piston Turning & Grinding Machine, m.d., late

CENTERLESS GRINDERS

No. 2 Cincinnati, m.d.
Cincinnati Valve Seat Grinder, cap. ⅜" valve stems, m.d.

PLAIN CYLINDRICAL GRINDERS

6x18" Landis Plain Self-Contained, m.d.
6x18" Landis Type C Hydraulic, m.d., late
6x30" Cincinnati Hydraulic, m.d.
No. 10 Brown & Sharpe Self-Contained, m.d.
No. 11 Brown & Sharpe Self-Contained, m.d.
10x36" Cincinnati Hydraulic, m.d.
10x72" Landis, m.d.
10x72" Norton, motorized
12x36" Landis, m.d.
12x96" Landis Plain Self-Contained, m.d.
14x18" Cincinnati Plain Self-Contained, m.d.
14x52" Norton, motorized
14x48" Cincinnati Plain Self-Contained, m.d.
16x72" Landis Plain, m.d.
No. 20—10x18" Brown & Sharpe, m.d., late
20x120" Landis Plain Self-Contained, m.d.

DISC GRINDERS

No. 2 Gardner, belted m.d.
No. 151 Besly, m.d.
Hammond Disc Grinder, Model No. 600
Model V10 Hammond Belt Sander, m.d.
No. 4 Gardner Disc Grinder, m.d.
No. 20 Gardner Comb. Disc Grinder & Roll Sander, m.d.
7½ H.P. U. S. Elec Tool Co. Disc Grinder, m.d. new
No. 24—53" Gardner, m.d.

EMERY GRINDERS

3 H.P. Baldor Pedestal Type, 32M
5 H.P. U. S. Elec. Tool Co. Model 95
#516 Mummert & Dixon Radial Emery Grinder, m.d., 5 H.P. motor
Hammond Model 4 Carbide Grinder

UNIVERSAL CYLINDRICAL GRINDERS

6x20" Fitchburg Hydraulic Spline & Gear Grinder, m.d., latest
12x36" Cincinnati Self-Contained, m.d.
12x48" Cincinnati, arranged for spline grinding
16x24" Cincinnati Self-Contained, m.d.

CYLINDER GRINDERS

No. 50 Heald Hydraulic, m.d., 11-18" spindles
No. 55 Heald, m.d., 15-24" spindles
No. 73 Heald Airplane Cylinder Grinders, brand new, m.d., late type

INTERNAL GRINDERS

Wicaco Precision Internal Grinder, m.d., swing 12"
No. 16—22" Bryant, m.d., latest
No. 16RS Bryant, m.d., latest
No. 16—38" Bryant, m.d., latest
No. 24—21" Bryant, m.d., latest
No. 70A Heald, m.d., late type
No. 72A Heald Gagematic, m.d.
No. 72A3 Heald Sizematic, m.d.
No. 72A3 Heald Gagematic, m.d.
No. 72A5 Heald Sizematic, m.d.
No. 72A5 Heald Plain, m.d.
No. 72A5 Heald Plain, long bed type, m.d., latest
No. 73 Heald Airplane, m.d., brand new, latest
No. 74 Heald, m.d.
No. 649—16" Van Norman Automatic Oscillating Radius, m.d., latest
Series 5——No. 5 Bryant, m.d., latest

We carry an average stock of 2,000 machines in our 11 acre plant at Cincinnati. Visitors welcome at all times.

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CABLE ADDRESS **EMCO**

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FOR SALE

IMMEDIATE DELIVERY — WAREHOUSE STOCK

HOT ROLLED ROUNDS

1. 1/8" Dia.	2400 lbs
2. 3/16" Dia.	224 lbs
3. 1/4" Dia.	240 lbs
4. 5/16" Dia.	105 lbs
5. 3/8" Dia.	121 lbs
6. 1/2" Dia.	142 lbs
7. 3/4" Dia.	22 lbs
8. 13/16" Dia.	12 lbs
9. 15/16" Dia.	72 lbs
10. 1 1/16" Dia.	88 lbs
11. 1 3/16" Dia.	525 lbs
12. 1 1/4" Dia.	283 lbs
13. 1 3/8" Dia.	2761 lbs
14. 1 7/16" Dia.	76 lbs
15. 1 9/16" Dia.	1168 lbs
16. 2" Dia.	440 lbs
17. 2 1/8" Dia.	73 lbs
18. 2 1/4" Dia.	164 lbs
19. 2 7/16" Dia.	1663 lbs
20. 2 1/2" Dia.	5669 lbs
21. 2 3/4" Dia.	126 lbs

HOT ROLLED FLATS

1. 3/8"x1 1/8"	48 lbs
2. 3/8"x6"	111 lbs
3. 1/2"x6"	116 lbs
4. 1/2"x1 1/2"	90 lbs
5. 1/2"x1"	666 lbs
6. 1/2"x5"	645 lbs
7. 1/2"x1 1/4"	310 lbs
8. 5/8"x4"	134 lbs
9. 5/8"x5"	169 lbs
10. 3/4"x1 1/4"	146 lbs
11. 3/4"x2"	1105 lbs
12. 3/4"x2 1/4"	481 lbs
13. 3/4"x2 3/4"	1031 lbs
14. 3/4"x1"	105 lbs
15. 3/4"x2 1/2"	597 lbs
16. 1"x2"	241 lbs
17. 2 1/4"x2 1/2"	255 lbs
18. 2 1/4"x2 3/4"	343 lbs
19. 2 1/4"x4"	160 lbs
20. 2 1/2"x4 1/16"	578 lbs

HOT ROLLED SQUARES

1. 5/8"x5/8"	203 lbs
2. 7/8"x7/8"	415 lbs
3. 1 1/8"x1 1/8"	450 lbs
4. 1 1/4"x1 1/4"	58 lbs
5. 1 3/8"x1 3/8"	71 lbs
6. 1 3/4"x1 3/4"	60 lbs
7. 2"x2"	240 lbs
8. 2 1/4"x2 1/4"	277 lbs
9. 2 1/2"x2 1/2"	172 lbs
10. 3"x3"	394 lbs
11. 3 9/16"x3 9/16"	191 lbs

HOT ROLLED HEX

1. 5/8"	25 lbs
2. 7/8"	30 lbs
3. 1 1/2"	810 lbs
4. 1 5/8"	129 lbs
5. 1 3/4"	46 lbs
6. 1 13/16"	2161 lbs
7. 2 9/16"	4764 lbs

ROUND BARS—HIGH CARBON

1. 1 7/16"	6,125 lbs
2. 1 13/16"	100,151 lbs
3. 1 15/16"	118,496 lbs
4. 8 5/8"	9,578 lbs

ROUND BARS—SAE 1095

1. 2 1/16" Dia.	10,750 lbs
2. 2 3/8" Dia.	7,006 lbs
3. 2 13/16" Dia.	5,175 lbs
4. 2 7/8" Dia.	14,329 lbs

ROUND BARS—ALLOY

1. 1" Dia.—Aircraft	3,000 lbs
2. 2 5/16" Dia.	8,742 lbs

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BLISS No. 55 Double Action Toggle Draw Press, Bed Area 38" x 33", Stroke of Blankholder 10" Stroke of Plunger 21", Air Clutch. New in 1945.

BLISS No. 88 Straight Side Single Crank Press, Capacity 255 ton, Bed Area 30" x 29", 18" Stroke of Slide, Marquette Air Cushion.

TOLEDO Double Cranks, Nos. 91-42, 92C, 93½C, 93½E.

CLEVELAND Double Cranks 65-G-72, 45-D-60.

NIAGARA Double Cranks, 67C, 68C, 612C.

BLISS No. 25K Knuckle Joint 600 Ton Capacity

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250 Ton Hydraulic Press, w/Mtr., Pump, & Accumulator System.

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Putnam Vert. Slotter, 3'6" Table w/Mtr.

Putnam Lathe, 42" x 10'.

Racks, Layout & Bending Tables, Material Handling Buckets & Trays.

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6000 Lb. Chambersburg double frame Steam Forging Hammer.

Multiple Punch No. 30-A W. W. 600-tons.

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Multiple Punch Size G. L. & A. 940-tons.

300 Ton Oil Geared High Speed 2-Column Hydraulic Press, Stroke 18", ram 27"x23".

Nipple Threading Machines (3), New 1950 ½", 1¼", 2". Roller Pipe Cutter.

1½", 2", 3", 4" Ajax Upsetters, suspended slides.

National Upsetting & Forg. Machs. 1", 4".

Ajax and Acme Upsetting & Forg. Machs., not susp. slides, sizes from 1" up.

Williams White Horizontal Bender & Straightener, Capacity 15" beams.

W.W. Bulldozers, #22, #3, #4, #29-U, 50 ton W.W. Hydraulic.

Chambersburg Board Drop Hammers, 800 lb., 1200 lb., 2000 lb., 3000 lb.

Single & Double End Punch Presses, various capacities.

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Nazel Air Forg. Hammer #6-B, 7" sq.

Bradley Hammers, Cushioned Helve, Upright & Compact.

Bar Shear #12 B. C. Buffalo 5" Rd.

Bar Shears, Open End., Table cast on Slant; also Guillotine 1½" to 3".

Knuckle Joint Press 200-ton, 6" str.; EG-54 Ferracute 400-ton.

600-ton R. D. Wood Incl. Hydr. Locomotive Wheel Press, 96" betw. bars.

400 Ton Chambersburg Hydraulic Wheel Press.

#50-A Quickwork Whiting Rot. Shear ¾".

Tensile Testing Machines, 50,000, 100,000, 200,000, 300,000.

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AUTOMATIC, 1¾"—4 Spin. Gridley Model G
BOLT THREADER, 1½" Reliance Williams
VERT. Attach. for Boring Mach. for 330T G. & L. Mill & Outer Support
BORING MACH., 3¾" bar Defiance Tble. Type
BORING MACHINE, 3½" Bar G. & L., Tble. Type
BORING MACHINE, 3" Bar Lucas, Table Type
BORING MILL, 100" Cincl., Heavy, 2 Heads, M.D.
BORING MILL, 100" N.B.P., 2 Hds., PRT
BORING MILL, 72" King, 2 Hds., M.D.
BORING MILL, 72" N.B.P., 2 Hds., M.D.
RADIAL DRILL TABLES, 36" x 20" x 20" (10)
RADIAL DRILL, 6' 15" col. Amer., M-on-Arm
RADIAL DRILL, 5' 15" col. Amer., M-on-Arm, Trl.
RADIAL DRILL, 5' 14" Col. Amer., M.D.
RADIAL DRILL, 5' Niles, No. 10, M-on-Arm, Late
RADIAL DRILL, 4' 13" Col. Amer., Motor on Arm
RADIAL DRILL, 4' 11" Col. Cincl. Blck., M.D.
RADIAL DRILL, 4' Western, M.D. (2)
RADIAL DRILLS, 3' 8" & 2½' (New)
DRILL, 24" Cincl. Blck., Tapping
DRILL, No. D8 Colburn 36", 5" capty.
DRILL, No. 814 Baker, 24", 3" capty.
GEAR CUTTER, No. 13, D. & S. Spur & Bevel
GEAR SHAPERS, Nos. 6 & 75 Fellows
GEAR SHAPERS, Nos. 61A, 64A & 64 Fellows, 1945
GRINDER, CYL., 4"x18" Landis #4H
GRINDER, SURFACE, 30" Blanchard, No. 16, M.D.
GRINDER, SURFACE, 14" P. & W. Vert. Spin. B.B.
GRINDER, UNIV., 12" x 36" Thompson, M.D.
GRINDER, Micro Int. M.D.
KEYSEATER, No. 3½ Baker, 26" x 4" capty.
LATHE, 60" x 45' con. Mackintosh-Hemphill, 1942
LATHE, 48" x 20' Bed Amer., T.A.
LATHE, 48" x 20' Can. N.B.P., M.D.
LATHE, 32" x 14' S. & B., M.D., T.A.
LATHE, GAP, 28"/50" x 16' Rahn Larmon, T.A.
LATHE, 26"/48" x 24' Bed, McCabe, Dbl. Spin.
LATHES, 26"x12' Bridgeford QCG Grd. Hd., M.D.
LATHE, 25" x 12' Bed, B & E, T.A., Grd. Hd.
LATHE, 20" x 78" Metra, T.A., New
LATHE, 20" x 10' Bed Amer., Grd. Hd.
LATHE, 18" x 8' Bed, L. & S. Select Grd. Hd., M.D.
LATHE, 16" x 60" Can. P. & W., M. In Base
LATHE, TURRET, No. 3A W. & S., No. 699397
TURRET LATHE, 21" Acme Univ., Brass, Late
TURRET LATHE, No. 1B Fester, Univ. 2" capty. (2)
TURRET LATHE, No. 2B Foster, Univ. 3¼" capty.
TURRET LATHE, No. 3 AL Gisholt, 6¼" H. S.
TURRET LATHE, No. 3 Gisholt, Bar & Chuck
THREAD MILLER, 12" x 60" Morey Shield, '43
MILLER, Abene (like Van Norman) New
MILLER, No. 000 B. & S. Plain, M.D. Late
MILLER, No. 0 Sundstrand Rigidmill Hand
MILLER, No. 2 Van Norman, Duplex, M.D.
MILLERS, No. 3 Cincl. Pl. Motorized
MILLER, No. 4 Cincl., High Power Universal
MILLER, No. 22L Van Norman Ram Type
MILLER, UNIV., Nos. 3 & 2 Cincl.
MILLER, No. 2 Stand K. & T. Univ., Vert. Attach.
MILLER, DUPLEX, 36" Ingersoll, 7½" Quills, New 1937
MILLER, UNIV., No. 1½ B Special K. & T. M.D.
PLANER, PLATE, 30" x 1" Cleveland, M.D.
PRESS, Hydr., 200 Ton, Sec[illegible] Flanging
PRESS, No. 73½ Bliss S.[illegible], 70 ton capty.
PRESS, No. 58, Toledo S[illegible], 171 Ton capty.
SHAPER, 36" Morton Draw cut
SHAPERS, 32", 28", 20" & 16" Gould & Eberhardt
SQUARING SHEAR, 8' x 3/16", Geo. Ohl

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74" UNGERER BACKED UP LEVELER

Late Type—Rebuilt

23 Work Rolls 1-11/16 x 81" Long

Capacity 16 Gauge and Lighter

Complete With

Motor and Controls

Including Runout Table

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#425 Campbell "Cutalator" Wet Abrasive Saw. Cap. 3½" bar, 4½" tube, 220/440/3/60. New 1942.

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FULLY GUARANTEED

EARLE E. KNOX COMPANY

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#26 Buffalo Forge Armour Plate Slitting Shear, 1¼" Round Cap. 10HP.

#1 Buffalo Forge Wrapping Rolls, M. D.

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18 Ward St. Baker 5887 Rochester 5, N. Y.

PRE-2 AIR COMPRESSORS

1—5600CFM 42 x 25½ x 30, 930 HP SYN.
1—4690CFM 48 x 24 x 27, 804 HP. SYN.
1—2400CFM SULLIVAN, WN4, 22/13 x 14, 400 HP, SYN.
2—600CFM CLARK, 4 Cyl. 12 x 11, 125 HP. SYN.

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MOTORS – M. G. SETS – TRANSFORMERS

ENGINEERED AND REBUILT BY SPECIALISTS IN OUR MODERN PLANT

CRANE AND MILL MOTORS—230-VDC

Qu	HP	Make	Type	RPM
1	265/200	G.E.	MDP 420	350/410
(Spare armature & anti-friction bearings for above motor)				
1	150/200	Whse.	MCB-100	370/300
1	150	Whse.	MT-5	350
1	100/140	Whse.	MCB-90	500/415
4*	100/140	G.E.	MDA-108	430/500
3	100/130	G.E.	CO-1831	675/600
2	85/65	Whse.	K-10	635/700
1	75/60	Whse.	K-10	425/470
1*	75/100	Whse.	CK-10	500/675
5	70/90	Whse.	MCA-70	440/400
2	70/90	Whse.	MCB-70	440/400
1	50/80	C.W.	FW	575/480
1	50	G.E.	CO-1829	750
1	50/65	Whse.	MCLA-121	500/450
2	50/65	Whse.	MCA-60	475/425
1	50	G.E.	CO-1810	725
1	65/85	G.E.	CO-1830	700/650
1	65/85	G.E.	CO-1811	600/500
4	45/57	Whse.	K-9	515/470
1	45/57	Whse.	KG-9	515/470
2	35/45	G.E.	CO-1810	500/450
1*	35	G.E.	MDA-104½	650
1	30	C.W.	EH	750
1	25/35	G.E.	CO-1829	750/450
1	27½	Whse.	K-6	1050
2	25/33	G.E.	MDS-408	575/500
2	23/30	G.E.	MDP-408	600/415
3*	20/28	Whse.	MCA-40	600/470
6	19/15	Whse.	K-5	630/560
3	16/19	C.W.	BW	620/560
1	16/13	G.E.	MDS-406	615/700
1	15	G.E.	CO-2505	700
1	15/19	G.E.	CO-1807	600/525
1*	13/17	G.E.	MDA-103	645/725
1*	13/17	G.E.	MDB-103	645/725
6	12/9	G.E.	MDA-102	875/725
3	11/13	C.W.	A-2-W	1050/910
1	12¼/10	Whse.	K-4	600/690
2	10/13	Whse.	MC-41	725/610

MOTOR GENERATOR SETS

Qu	KW	Make	RPM	Volts DC	Volts AC
1(3-U)	2100	Whse.	720	600	2300/4800
2	1500	G.E.	600	600	4150/2300
3	1000	Whse.	514	600	11000/6600
4	1000	G.E.	514	600	11000/6600
1	1000	G.E.	514	600	2300
1	500	C.W.	720	275	2300/440
1(3-U)	500	Whse.	1200	250	440
2	500	C.W.	720	575	2300/440
1	400	C.W.	1200	125/250	2300/440
2	250	Whse.	1200	125/250	2300
1	200	Ridgway	900	275	2300
1	155	G.E.	720	250	2300/440
2	150	Whse.	1200	250	2300
1	100	Al. Ch.	1200	125/250	4000/2300
1	100	Delco	1200	125/250	440/220
1	100	Ridgway	1200	275	4000/2300
1	100	C.W.	1200	125	440/220
1	85	C.W.	1200	250	440/220
1	75	Al. Ch.	900	250	2300
1	75	Whse.	900	75	2300
1	50	Burke	1750	250	440/220
1	25	Ideal	1750	125	220
1	25	Al. Ch.	1200	250	440/220

We can furnish any of these sets with exciters and VARIABLE VOLTAGE CONTROL engineered and rebuilt to your requirements.

Motor Generators of modern design, complete with control—still on their original foundations—available for immediate shipment.
(3)—G.E. 1500-KW, 250-VDC, 514 R.P.M., cpd., interpole, pole face windings. 2100-HP syn. motors, .8-PF, 13,200-V, 3-p, 60-cy. will reconnect to 6600-V. or 4160-V.

SYNCHRONOUS MOTORS

Qu	HP	Make	P.F.	Volts	RPM
1	6000	G.E.	100	2300	90
1	3000	Whse.	80	4800/2400	720
2	2100	G.E.	100	2300	360
2	1750	G.E.	100	2300	3600
1	750	G.E.	80	2300	450
1	600	G.E.	100	440	360
1	700	G.E.	80	2300	720
1	250	G.E.	100	2300	514
1	200	Whse.	80	440	1200
1	187	G.E.	80	440	720
1	150	G.E.	100	2200	900
1	150	G.E.	100	550	600
1	120	G.E.	80	550	450
2	125	G.E.	80	4000/2200	1200
3	125	El. Mchy.	100	4800/2400	900
1	125	G.E.	80	2200	900
2	100	Whse.	80	440	1800
1	100	Ideal	80	440	900
2	100	G.E.	80	440	600

With these we can supply—Manual, Semi on full magnetic reduced or full voltage control.

SLIP RING MOTORS—CONSTANT DUTY
3-Phase—60-Cycle

Qu	HP	Make	Type	Volts	RPM
1	1800	G.E.	MT 498	2300	357
1	1200	G.E.	MT 26	2200	277
2	1000	Al. Ch.	ANY	2200	235
1	800	G.E.	MT	2200	440
1	700	Whse.	CW	2300	720
1	600	G.E.	MT 20	2300	360
1	500	Al. Ch.	ANY	2200	514
2	500	G.E.	I-16-H	2300	450
1	400	G.E.	MT 418	2200	440
1	250	Whse.	CW 937	440	1200
1	250	Al. Ch.	ANY	440	720
1	250	G.E.	MT 414	2200	300
1	125	Whse.	CW 870	2200	900
1	100	Whse.	CW 766	440	1200
1	100	F.H.	H 20 C	440	900
2	100	G.E.	I-15A-M	2300	514

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HP	VOLTS	MAKE	TYPE	SPEED	WDG.
400	2200	G.E.	MT	450	S.R.
300	2200/4000	G.E.	IM	450	S.R.
200	2200	G.E.	IM	600	S.R.
150	220/440	G.E.	ATI	600	Syn.

Large stock of smaller A.C. motors

CRANE MOTORS—West. K5 & K3/w brakes
Also 230 V. DC motors rated 400-200-125-75-60 HP

MOTOR GENERATOR SETS

400 KW West.	720 RPM	600 V. Syn. 3/60/2300 v.
300 KW G.E.	1200 RPM	250 V. Syn. 2300/4000 v.
240 KW G.E.	1200 RPM	250 V. Syn. 2300/4000 v.
225 KW G.E.	1200 RPM	125 V. Syn. 2300/4000 v.
150 KW G.E.	1200 RPM	250 V. Syn. 2300/4000 v.
100 KW Ridg.	1200 RPM	250 V. Syn. 2300/4000 v.
75 KW West.	1200 RPM	250 V. Syn. 220/440 v.
50 KW G.E.	1200 RPM	250 V. Sq. Cg. 220/440v.
35 KW G.E.	1800 RPM	125 V. Sq. Cg. 220/440v.

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AUTOMATIC

2⅝" Conomatic, 8-spindles, with 40 HP. motor 3/60/220, including conveyor, collets, pushers, bushings, gears, cams, two threading spindles, with accelerated reaming and tapping attachment. New Oct. 1942.

THREAD GRINDER

#33 Excello External, cap. 6"x8"x18" with dresser, taper and 5 lead screws, motors 3/60/220-440 V., New 1943.
Extra Equipment consists of: Balancing Stand, DC. Motor for headstock and Motor Generator Set.

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1000 K.W.
Allis-Chalmers
275 Volt DC.
Synchronous Motor Generator Set
720 R.P.M.
Late Type—Modern
2300/4000 Volts A.C.
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Automatic Reduced Voltage Starting Gear and D.C. Panel Board

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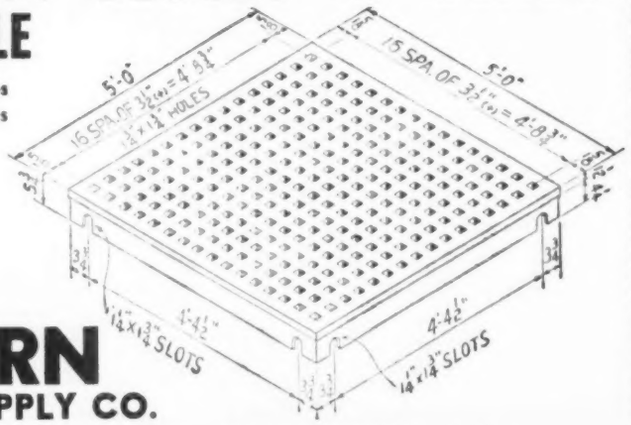

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SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 11:00 A.M., Eastern Standard Time, on Tuesday, December 30, 1952, for Contract 437, for furnishing, testing, delivering and unloading gasoline-engine generator sets with switchgear and appurtenances for the West Branch and the Kensico South effluent chambers of the Delaware Aqueduct, all as set forth in the specifications.

No bid will be received and deposited unless accompanied by a certified check upon a National or State bank, drawn and made payable to the order of the Comptroller of The City of New York, in the amount of two thousand dollars ($2,000.00), for the proper execution of the contract.

At the above place and time the bids will be publicly opened and read. Pamphlets containing information for bidders, forms of bid and contract, specifications, requirements as to surety, etc., can be obtained in Room 1316 at the above address, upon application in person or by mail, by depositing the sum of five dollars ($5.00) in cash or its equivalent for each pamphlet. Within 30 days following the award of contract or rejection of bids, the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of four dollars ($4.00) will be made for each other pamphlet returned in acceptable condition. For further particulars, apply at the office of the Chief Engineer at the above address.

IRVING V. A. HUIE, President, RUFUS E. McGAHAN, EDWARD C. MAGUIRE, Commissioners, Board of Water Supply; BETTY COHEN, Acting Secretary.

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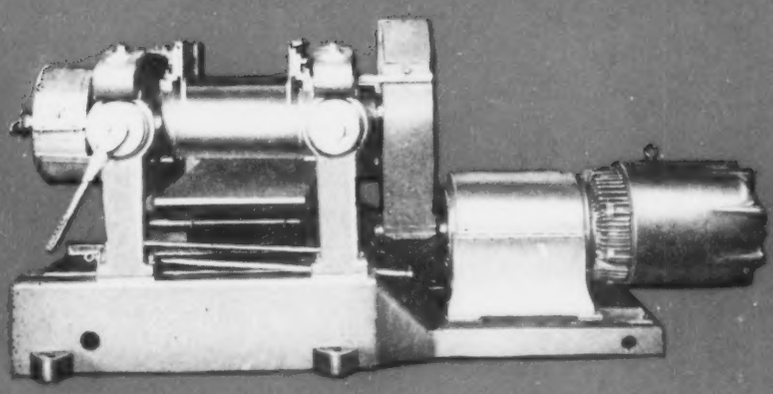

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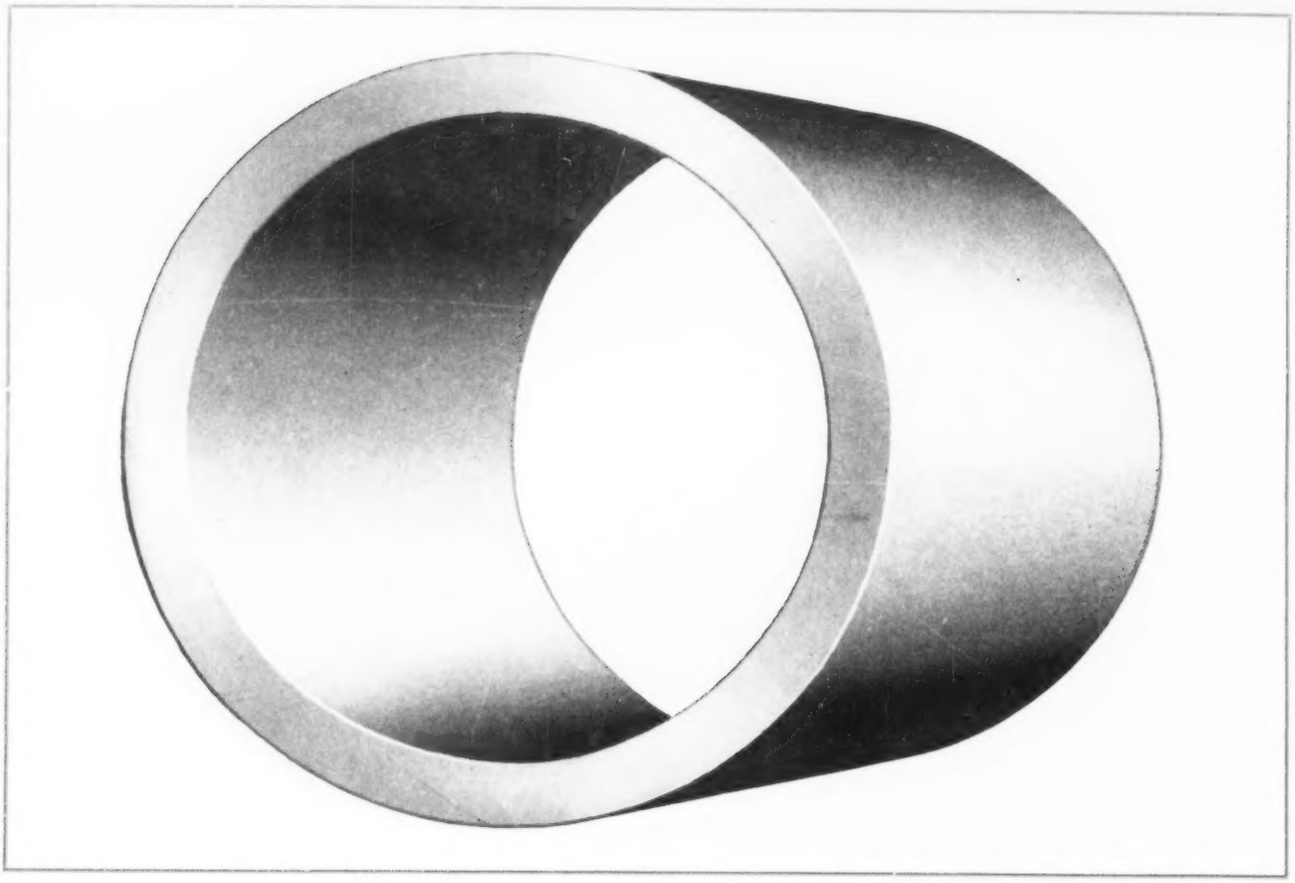

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